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NOVEMBER/DECEMBER 2016

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Higher Education and
Democratic Capitalism
—Anthony P. Carnevale

Optimizing Technology's
Promise
—Brenda J. Allen

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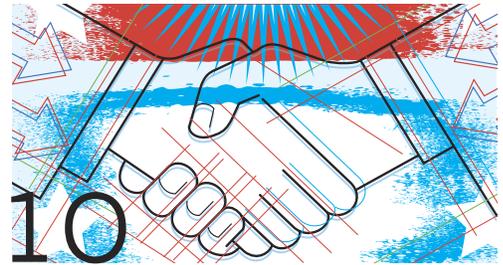
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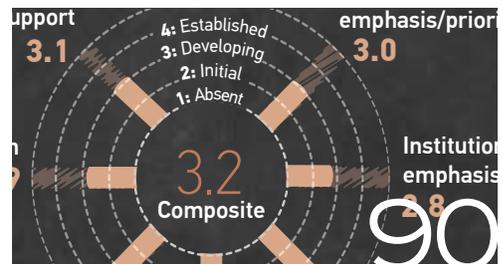
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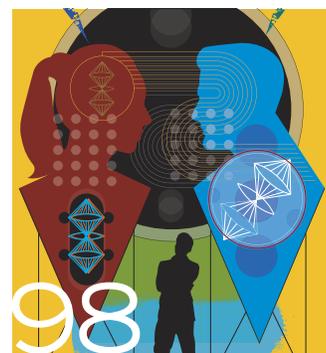
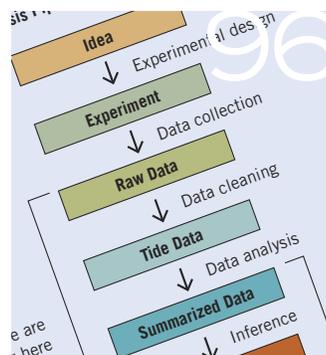
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Volume 51, Number 6. *EDUCAUSE Review* (ISSN: 1527-6619) is published bimonthly (6 issues per year) by EDUCAUSE, 282 Century Place, Suite 5000, Louisville, CO 80027. Subscriptions are available at \$48 per year (\$78 per year outside North America) and to all academic libraries (North America and international) at \$48 per year. Single copies are available for \$10.00 each. Periodicals postage paid at Boulder, CO, and additional mailing offices. POSTMASTER: send address changes to EDUCAUSE, 282 Century Place, Suite 5000, Louisville, CO 80027.

Publications Mail Agreement #40033384
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Sketching Our Future

There's so much to love about campus life and campus rhythms, and among the most energizing is the flurry of end-of-semester recognitions, awards, and celebrations. It's inspiring to see the look on students' faces when they are named Student of the Year or to observe the sense of accomplishment felt by faculty and staff when they are honored for their achievements. For EDUCAUSE, this is our time to celebrate our community. At our annual conference, we welcome thousands of attendees to learn, share, and engage in celebrating our past successes and solving our current challenges. We also energize ourselves by recognizing the winners of the EDUCAUSE Leadership, Community Leadership, and Rising Star Awards (highlighted in this issue of *EDUCAUSE Review* as well). The work we do to create connections, build the profession, and enhance decisions happens all year. However, our annual conference is our most profound expression of community. For those reading this Homepage column at the conference in Anaheim, welcome!

This is also the perfect time to share with the EDUCAUSE community my deep appreciation for the remarkable board members who represent your interests and help sketch the future of our association. The board plays a crucial role every year, but this year its leadership has been uniquely important as we are delivering our new five-year strategic plan. I'm proud to be part of this exceptional team, which has been actively involved for the last twelve months in forging the best path forward for our association. The three strategic priorities announced at the annual conference—personalized member experience, reimagined professional learning, and expanded partnerships and collaboration—represent bold and even transformational changes for EDUCAUSE over the next five years.

Our board members come from a wide variety of institutions. For example, our current board includes representatives from state systems, small liberal arts colleges, research-intensive universities, community colleges, and large state institutions with a strong undergraduate focus. However, the way the board represents EDUCAUSE members runs far deeper than institutional affiliation. For example, Joy Hatch began her board service while at a community college system, after her work at a community college for many years—and at a liberal arts college before that. While serving on the board, she became the CIO at a master's-granting institution. Joy will be the first to underscore that she and her board colleagues represent the breadth and depth of EDUCAUSE members; they provide insight and vision for everyone, not for any particular constituency. For the board, the “common good” part of our commitment to “Uncommon Thinking for the Common Good” is not a rhetorical flourish but, rather, a day-to-day priority.

This commitment is important because our election process means that we don't control the balance of institutional affiliations from year to year. Occasionally a group perceived as over-represented one year may be considered to be under-represented another year. To address any imbalances and bring in important perspectives, EDUCAUSE uses at-large appointments. For example, as we set out on a year of planning in 2016, the board appointed experts from other associations: Reggie Henry, CIO of the American Society of Association Executives (ASAE), and Edward Leach, executive director of the National Institute for Staff and Organizational Development (NISOD). Leach also previously served as a vice president at the League for Innovation in the Community College and held a number of community college leadership positions. For 2017, the board has appointed Joseph Moreau, a representative from the community college sector, to an at-large board seat, ensuring representation from two-year colleges.

As is evident from the strategic plan, the EDUCAUSE board has a strong commitment to diversity of all kinds, not just institutional type but also gender, racial/ethnic background, and other demographics. Board members join me in urging the EDUCAUSE community to develop and recruit board candidates who represent the broad range of voices that need to be heard. Although the board is currently as diverse (race/ethnicity) or more diverse (gender) than the community we serve, broad representation on the board has been and will continue to be a priority. The EDUCAUSE board represents a community of tremendous richness and variation, and we embrace the

The EDUCAUSE board embraces the conviction that diversity and inclusion allow us to better serve our higher education community.

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(continued from page 4)

conviction that diversity and inclusion allow us to better serve our higher education community. EDUCAUSE will grow in influence and service as we embody ever more varied perspectives, work experiences, lifestyles, and cultures.

Finally, I would like to take this opportunity to extend my thanks to those completing service on the EDUCAUSE board after the October 2016 board meeting. Joy Hatch, vice president for technology at Fort Hays State University, is a highly valued leader, one who does not speak frequently but, when she does, everyone stops to listen. Justin Sipher, vice president for libraries and information technology at St. Lawrence University, was an EDUCAUSE board officer for three years, and we all have been the lucky recipients of his thoughtful, intelligent counsel and good cheer. Bruce Maas, vice provost for information technology and CIO at the University of Wisconsin–Madison, is completing not only his service on the board but two years as board chair. Bruce is acknowledged by his board colleagues as an exemplary leader with a long and strong devotion to the EDUCAUSE community. I am personally grateful for the time and care he has spent ensuring a smooth transition for me over the last year. Bruce's service on the board is a wonderful capstone to an inspiring career, and we all wish him well as he retires from UW in the spring of 2017.

As these three remarkable leaders complete their service on the board, a new EDUCAUSE board will be forming, including a new chair. Please join me in helping all of our board members feel welcome, and please honor their service by sharing with them your ideas, concerns, hopes, and dreams for this community that means so much to all of us. This is how we will continue to sketch and shape our future.

John O'Brien (jobrien@educause.edu) is President and CEO of EDUCAUSE.

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Source: ¹refuelagency.com, "2014 College Explorer," 2014



Enabling Transformative Change

Each summer for the past fifteen years, I've been an instructor at the Harvard Seminar for New Presidents. I facilitate a session for new and aspiring presidents on building effective leadership teams and enabling transformative change. Over the past two decades, I've also worked with dozens of new presidents at public and private institutions as they've transitioned to their roles and responded to a range of challenges. Several insights emerging from these interactions have proven to be valuable for college/university presidents and also for new leaders in other settings. UMBC CIO Jack Suess and I agree that these insights may have particular value for campus IT leaders, who confront the inevitable challenges that arise in an area characterized by increasing complexity and rapid change.

My first piece of advice is to learn and understand the campus culture by meeting and getting to know a variety of campus leaders. In his book *The Social Animal: The Hidden Sources of Love, Character, and Achievement*, David Brooks postulates that culture has everything to do with our habits, beliefs, practices, and relationships—affecting even the kinds of tensions that impact our lives and relationships. In higher education, we define our role on campus both in terms of how we see ourselves as individuals and in terms of where we want the institution to go. To lead effectively, one must understand the diverse viewpoints held by members of different groups, including students, faculty, staff, and alumni. I encourage new leaders to seek out individuals from each of these groups for intimate one-on-one discussions. I recommend that in these discussions, leaders ask stakeholders to share their visions of the future and also to identify others they consider to be leaders on campus.

Many institutions are focused on student success, and we know that academic departments—and faculty in particular—are the key agents for strengthening an institution's approach to improving student success. As a result, an institution's faculty culture, which is built on critical inquiry and healthy skepticism, must be understood in order to begin changing deeply held beliefs, attitudes, and priorities. Strong leadership—through shared governance—can create the vision, set the tone, emphasize critical values, and build trust among diverse groups. Strong management can ensure that appropriate functions are executed properly and are fully assessed.

Successful technology plans further the efforts of a campus to improve student success, advance scholarship and research, and change the way we teach.

My second piece of advice is that it is important to build strong teams. Leaders work with others to set the agenda. Effective leadership teams build trust among the team members and with the campus as they manage day-to-day operations and implement new initiatives. New leaders must balance the advantages of keeping the current team in place in order to leverage existing relationships and move quickly versus the possible benefits of hiring externally and bringing in fresh perspectives.

No matter the approach taken, vacancies in the leadership team will occur over time. When I have critical vacancies, I first look closely at campus leaders to fill those roles. I look for leaders who understand the university's institutional culture, share the values of the institution, and have effective relationships with others. I have selected two provosts and a dean who were all former leaders of our faculty senate. These leaders understood our culture, had demonstrated sound judgment in difficult situations, and had built strong relationships with others on campus. I knew they would offer the President's Council and me valuable counsel and would make their decisions in the university's best interest.

In building a team, new leaders need to take the time to make certain that members can work well together. Obviously, conflicts or a lack of trust among members of this group can undermine their ability to execute strategic priorities. This does not mean that the team should always be in agreement on what or how something should be done; however, once everyone has been given the chance to raise concerns and a decision has been made, the team must agree to fully support the decision. I'm often asked how to develop a shared vision among these leaders. First, it is important to make certain that when making a decision, we are focused on how we can advance our mission, especially when it comes to the core values of helping students succeed. Second, I encourage members of the leadership team to meet regularly with each other in both private and group meetings. They need the opportunity to understand how each person approaches a problem. Finally, when I meet with them in one-on-one sessions, I encourage them to collaborate with others on campus on specific ideas and initiatives.

I often encourage leaders to inspire those around them by focusing on personal stories that connect to the mission of the university. We know that education has the power to change lives, and many of us have seen that power firsthand. For my



By **FREEMAN A. HRABOWSKI III**, with **JACK SUESS**



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robust discussions about the integration of technology in the implementation of new initiatives.

Successful IT leaders bring the key members of their team into campus decision-making committees. By having other IT members serve on campus committees and participate in the formal and informal governance structures used on campus, the IT organization becomes embedded in campus decision making. As part of building the IT team, leaders must look for people who understand and share the values of the institution. At UMBC, we have a long history of IT staff participating in

institution, telling meaningful personal stories inspires all of us to do more and gives the broader leadership team a sense of purpose.

In summary, these three actions form the basis for leading: (1) learning, through discussion, the core values and principles of the institution; (2) building a strong leadership team that represents all constituent groups and that can work cohesively to execute plans; and (3) using personal stories to connect your efforts to the core values of the institution. But how do these lessons apply more specifically to IT leaders?

As the president of a research university, I understand that technology plays an important role in the success of any major campus initiative. For the institution to be successful, the IT leaders need to be viewed as collaborators and thought partners on campus. IT leaders must understand the institutional culture and be willing to build relationships with faculty and staff across the campus. For faculty and staff to use technology to its fullest potential, they must believe that the technology leaders understand and share the core values of the institution. Technology leaders must work closely with other members of the leadership team to learn how they have successfully engaged campus stakeholders and how they structure their advisory committees to support making decisions and setting priorities. To the extent that IT leaders understand a campus's research initiatives and its interest in the teaching and learning process, they are able to engage faculty and others in the substantive work of the campus. The best IT leaders, in fact, see themselves as educators. They are engaged with others in thinking about effective teaching and learning, innovative research, and the influential role played by

shared governance. In addition to the CIO reporting to the president and sitting on the president's council, one of our emerging IT leaders is now president of the Professional Staff Senate, and another is the campus representative to the Council of University System Staff. Through efforts of this sort, the IT organization can build bridges across the different units on campus while developing staff leadership skills.

Successful technology plans further the efforts of a campus to improve student success, advance scholarship and research, and change the way we teach. All of these efforts require data and analytics to change perception and thinking. This is another area where information technology can play a critical role. IT organizations can support assessment by showing how data in separate systems can become very useful when captured and correlated. By leveraging data analytics, we are able to better assess student risk factors and develop interventions targeted to specific students.

Finally, successful IT leaders—just like successful institutional leaders—should identify and use their personal experiences to relate to the core of the institution: the academic program. Crafting and telling these stories will build a campus culture that embraces technology and enables transformative change. ■

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Higher & Education DEMOCRATIC CAPITALISM

Anthony P. Carnevale

Higher education has become a crucial element in the historical bargain between democracy and capitalism in the 21st century. This new reality has emerged gradually over the past thirty years, but for the most immediate evidence, look no further than the 2016 U.S. presidential election.



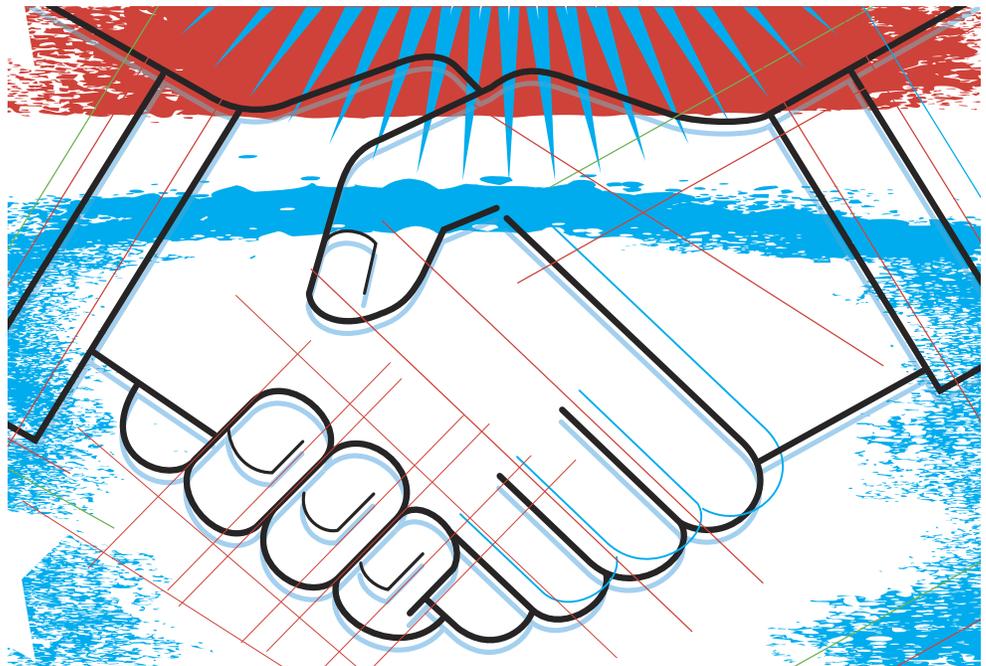
Both the Donald Trump supporters and the Bernie Sanders supporters can be viewed as evidence of insufficient postsecondary opportunities to reconcile the democratic promise of economic opportunity with the changing set of skills needed on the job. The Trump supporters can be portrayed, at least in part, as those left behind in the structural economic shift from a high-school-educated to a college-educated middle class—from an industrial to a postindustrial service economy. Their plight is due, in part, to the failure of postsecondary reeducation and retraining. Job training and lifelong learning are applause lines in every stump speech but are never a substantial line in any public budget. Meanwhile the Sanders supporters can be portrayed, at least in part, as millennial aspirants to middle-class earnings, desperate for relief from the requisite college cost and debt necessary to rise in modern postindustrial economies. Their plight is due, in part, to their own and their government's inability to keep up with the fast-growing cost of higher education. Both the Trump supporters and the Sanders supporters would benefit from a more transparent relationship between higher education programs and careers in the interest of decreasing costs and increasing both economic and noneconomic value.

The Need for a New Deal

The current populist rebellion suggests that we need a new deal between capitalism and democracy. An expanded vision for higher education is a crucial part of the bargain. A new deal between democracy

and capitalism begins with the recognition that capitalism and democracy have always been uneasy allies in their common pursuit of human flourishing. During

The current populist rebellion suggests that we need a new deal between capitalism and democracy. An expanded vision for higher education is a crucial part of the bargain.



the 18th and 19th centuries, democratic ideas and the growing power of economic markets grew together in the same British and European neighborhoods. Capitalism and democracy were allied in their revolt against feudalism, but they were also natural antagonists.

In theory, democratic citizenship and markets are driven by irreconcilable ideas. Democratic citizenship presumes equality, yet market economies are driven

by the economic inequality necessary to motivate work effort, entrepreneurship, and the inherently lopsided private accumulation of wealth and investment capital. Capitalism is also open to the risk of economic failure and the rewards of economic success as technology and competitive entrepreneurship destroy old jobs and create new ones.

Speaking at the Cambridge Reform Club in 1873, Alfred Marshall, the indispensable political economist of his time, was the first to try to square the equality implicit in citizenship with the inequalities and risk inherent in markets. Marshall argued that although capitalism and democracy were antagonists in theory,

they could also be allies in practice. He argued further that the contradictions between democracies and markets could be eased if markets would become the paymaster for a constant expansion in publicly funded education and social services.

Alfred proposed an early version of the classic liberal balance between strong democratic governments and strong markets. Market economies would



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generate the taxable wealth necessary to fund enough publicly provided education and social services to guarantee citizens full membership in society and the right to rise in the economy. Education, he argued, was a basic tool—along with expansion in universal and targeted social services from the welfare state—in resolving the contradictions between democratic citizenship and market economies. “The question,” he said, “is not whether all men will ultimately be equal—that they certainly will not—but whether progress may not go on steadily, if slowly, till, by occupation at least, every man is a gentleman” who values education and leisure more than the “mere increase of wages and material comforts.”¹

It is important to note that when Alfred spoke of the power of education to reconcile democratic citizenship and markets in 1873, he was talking about the kind of education that was associated with leisure and was valued more than the “mere increase in wages and material comfort.” Marshall was referring to the intrinsic value of what we now think of as liberal arts and humanities curriculums—the kind of education that encouraged the populace to “steadily accept the private and public duties of citizenship.”² Alfred assumed that basic education would be a universal common experience rather than a class-, gender-, and race-based sorting device for allocating economic opportunity. In his day people learned their occupations on the job, not in colleges or universities. He did not foresee that college-level education would confer wealth and power through access to the most highly leveraged knowledge and occupations.

Marshall was speaking in a European context in which German Chancellor Otto von Bismarck had already created a

welfare state that included old-age pensions, education, and health care for the working class. The welfare state grew at a grudging pace with industrialization in Great Britain and Europe as the government took on more responsibility for the economic and social welfare of

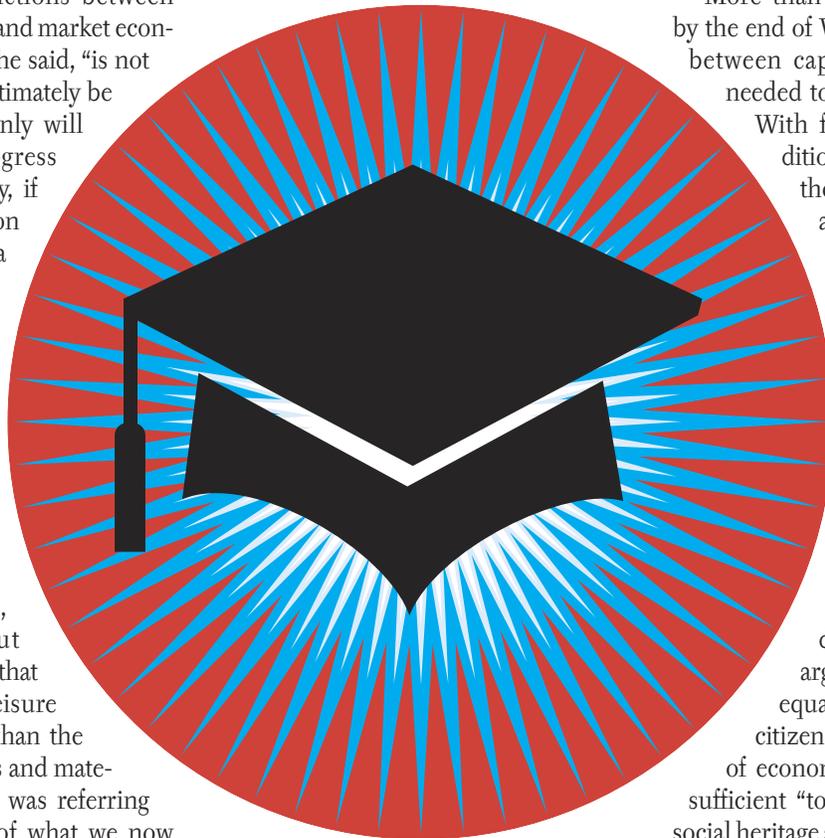
the working class, largely as a defensive measure against the socialist and communist left. Compared with Europe, the United States has always favored education to the more directly redistributive elements of the welfare state, in large part because education ties to individual responsibility.

More than seventy-five years later, by the end of World War II, the balance between capitalism and democracy needed to find a new equilibrium.

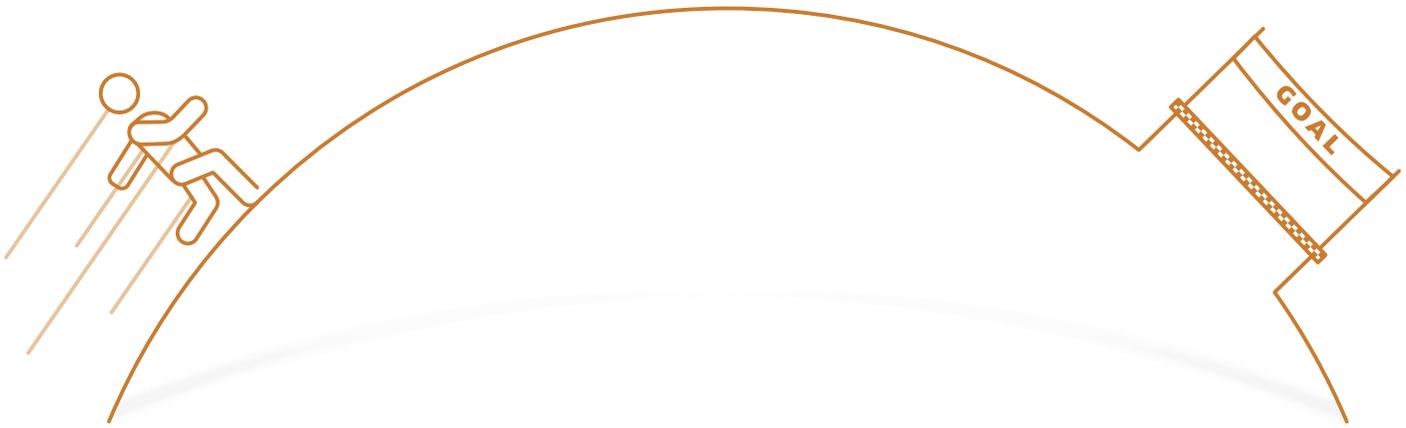
With fascism defeated unconditionally, the contest among the victors—the communists and the democratic capitalists—began in earnest with the new Cold War between East and West. In 1949 T. H. Marshall (no relation to Alfred) updated the original bargain between capitalism and democracy in a lecture commemorating Alfred Marshall’s classic formulation.

T. H. essentially doubled down on Alfred’s 1873 argument, asserting that the equality implicit in democratic citizenship implied “a modicum of economic welfare and security” sufficient “to share to the full in the social heritage and to live the life of a civilized being according to the standards prevailing in the society.” T. H. went on to explain that the institutions most closely connected with this notion of citizen equality in capitalist economies “are the educational system and the social services.” His lecture was seminal because it became the widely recognized summary argument for the massive expansion in both public education and the welfare state after World War II as an alternative to Soviet and Chinese communism.³

But in 1949 T. H. was prescient. He worried that the education solution to the problem of inequality in market economies had developed flaws since the time of Marshall’s lecture. He ruminated over the fact that the role of education as



Alfred Marshall did not foresee that college-level education would confer wealth and power through access to the most highly leveraged knowledge and occupations.



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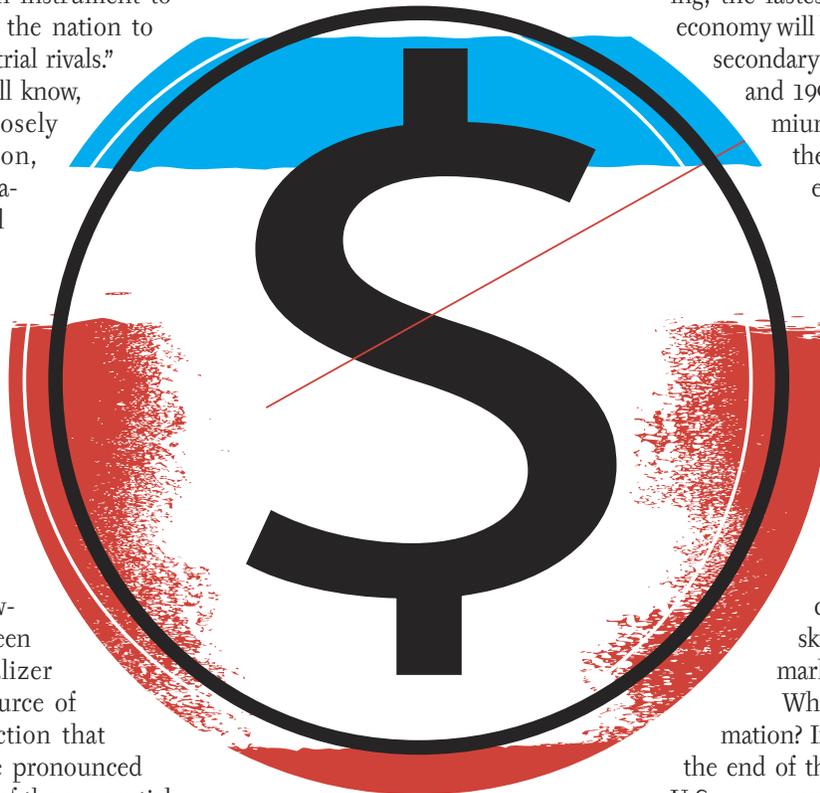
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a mediating force between citizenship and markets was increasingly compromised by the growing alignment between education and elite occupational preparation. Education made everyone equal as citizens, but those with the most education, especially in lucrative fields of study at the college level, were better able than others to accumulate wealth and power. Even then, T. H. fretted that industrial society had “been accused of regarding elementary education solely as a means of providing capitalist employers with more valuable workers, and higher education merely as an instrument to increase the power of the nation to compete with its industrial rivals.”

He continued: “As we all know, education today is closely linked with occupation, and . . . [through] its relations with occupational structure . . . operates as an instrument of social stratification.” The impact of K-20 becomes especially powerful because it is frontloaded in the life cycle: “The ticket obtained on leaving school or college is for a life journey.”⁴

T. H. foresaw the growing contradiction between education as an equalizer and education as a source of inequality, a contradiction that has become only more pronounced with the strengthening of the sequential alignment between access to higher education, choice of field of study, occupational choices, and individual earnings. Over time, education—especially access to postsecondary education and training—has become a double-edged sword: both a fountain of opportunity and a bastion of privilege. The postwar postsecondary system was destined to be a great leveler, especially among white baby boomers, but it also encouraged stratification that threatens to reproduce class and racial privilege.

Since the early 1980s, the burgeoning postsecondary education and training system has become the nation's workforce development system.



Postsecondary Education and Workforce Development

Since the early 1980s, the burgeoning postsecondary education and training system has become the nation's workforce development system. Of course, it is not news that education is a favored institution in U.S. culture: it conforms to our individualist biases, and we look

to education to help us reconcile democratic citizenship with class differences and various forms of diversity.

What *is* news is the unprecedented rate of growth in the strength of the relationship between postsecondary education and economic opportunity. Since 1973, the share of jobs requiring at least some college education has increased from 28 percent to at least 60 percent.⁵ And the trend will continue. By 2020, it is estimated that 65 percent of all jobs in the United States will require some form of postsecondary education⁶ or training; the fastest-growing sectors of the economy will be those that require postsecondary education. In the 1980s and 1990s, the college wage premium (the difference between the average wage of college-educated workers and that of high-school-educated workers) increased from 40 percent to more than 80 percent and has remained at that historically high level. The supply of college talent has quadrupled while the relative demand for college graduates has only doubled.⁷ This is a profound change in the demand for skilled workers in the labor market.

What is driving this transformation? In a word: *technology*. Since the end of the 1980–81 recession, the U.S. economy has been undergoing rapid structural change. Technology—led by information technology—has been automating repetitive tasks and activities. As a result, more jobs are nonrepetitive and require skills beyond high school. The resulting increase in skill requirements for entry-level jobs has made postsecondary education and training the gatekeeper for access to training on the job and to state-of-the-art technology at work.

For the most part, the relationship between the postsecondary system

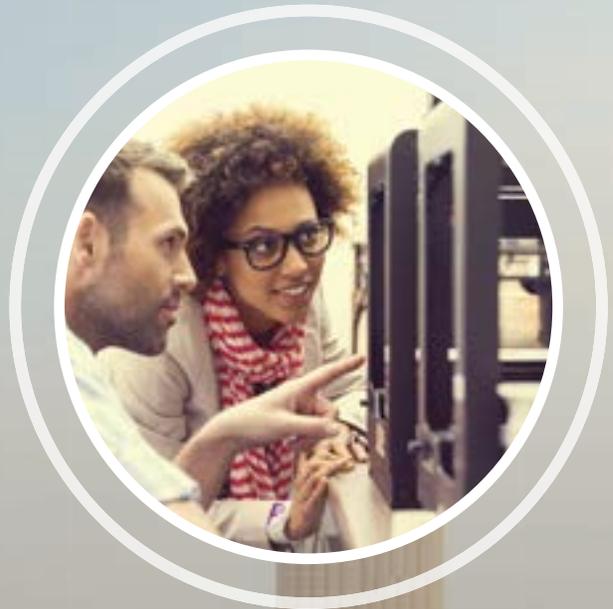
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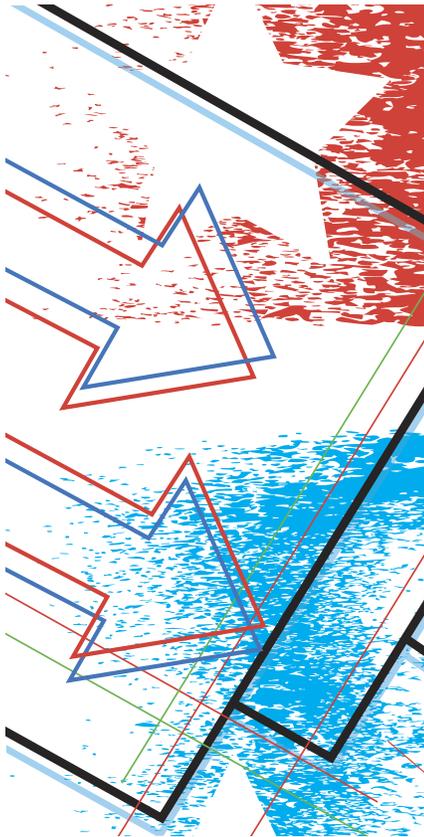


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Prototyping in robotics lab





The winners and losers are clear in this transition from an economy anchored in high school to an economy anchored in postsecondary education and training.

and labor markets operates through the alignment of fields of study and occupations. That is, the relationship is as much about programs as institutions. Currently, for example, virtually all graduate and professional education programs are specialized and are focused on elite occupations. Only 9 percent of bachelor's degrees conferred are in the liberal arts and humanities.⁸ The rest of the fields of study are aligned with particular occupational specialties in majors such as STEM, business, education, and healthcare. The vast majority of community college fields of study are occupationally oriented.⁹ Certificates, now contending with the bachelor's degree as the most prevalent award in the postsecondary system, tend to be occupational. In addition, tens of millions of Americans now get their job qualifications or skill upgrading from test-based industry certifications and government-sanctioned licenses, often tied to nondegree and noncredit postsecondary courses. In combination, the postsecondary learning system and the employer-provided learning systems provide nearly one trillion dollars a year in human capital development—between four and five hundred billion in formal postsecondary learning, along with more than one hundred billion in formal employer-based training and as much as four times that in informal learning on the job.¹⁰

With this new economic reality come new and sometimes counterintuitive rules of the game.

- **Rule #1:** Education level still matters. On average, individuals with higher levels of education earn more than those with lower levels. Someone with a bachelor's degree makes 84 percent more than a high school graduate during a lifetime of work—a difference that, over the course of a career, translates to \$1 million.¹¹
- **Rule #2:** Programs of study and majors matter even more. A bachelor's degree in petroleum engineering translates into a median yearly wage of \$136,000, compared with \$39,000

a year for a bachelor's degree in early childhood education.¹²

- **Rule #3:** Sometimes less education is worth more. Because of differences in field of study, 28 percent of people with associate's degrees, and many with one-year technical certificates, make more than the average earned by people with bachelor's degrees.¹³
- **Rule #4:** Field of study is important, but it does not control one's economic destiny. A major is more important for a first job than it is for a last job. There is wide variation in earnings in every field of study. That's why the top 25 percent of education majors will end up making more than the bottom 25 percent of engineering majors.¹⁴

Winners and Losers

The winners and losers are clear in this transition from an economy anchored in high school to an economy anchored in postsecondary education and training. High school graduates are being left behind. The good high school jobs are gone, and they're not coming back. High school alone no longer provides a living wage for women, and at most, only about 20 percent of men can still make it in what's left of the high-school-educated, blue-collar economy without a traditional postsecondary degree.¹⁵ Millennials are the first to face the economic risks and costs of this new reality. Before the 1980s, young American workers achieved the average U.S. hourly wage by age twenty-six. Today that same transition takes until age thirty or later, and many never make it.¹⁶

Meanwhile, the growth of the value of a college/university degree has certainly been good for those graduates:

- The college wage premium has spiked. By 2007, that difference reached 81 percent for men, compared with 37 percent in 1967. The story is similar for women, with the college wage premium rising from 54 percent to 81 percent over that time.¹⁷
- Most remarkable of all, the average wage advantage for college workers

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over high school workers has doubled even though the number of college graduates has *quadrupled*.¹⁸

Growth in the economic value of college has also been good for general education, the liberal arts, humanities, and social sciences, with 60–70 percent of coursework for every degree in these areas. Employers too have been big winners. Four-year college graduates, for example, make up 39 percent of the workforce and create 56 percent of the labor value added in the economy.¹⁹

On the other hand, the rise in the economic value of college has been bad news for the college have-nots. A study by the economists Claudia Goldin and Lawrence Katz finds that more than two-thirds of the growth in inequality between 1980 and 2005 is due to differences in access to and success in college.²⁰

The rise of postsecondary education and training as an economic necessity has been a mixed bag for working-class, low-income, and minority students relegated to the overcrowded and underfunded two-year colleges and to the open-admission four-year schools. For these students, access is up, but so are the risks of noncompletion:

- Since 1995, 82 percent of white students have gone to one of the 468 selective colleges, whereas 68 percent of African American and 72 percent of Hispanic students have gone to open-admission institutions.²¹
- 70 percent of students at the high-spending selective colleges are in the top socioeconomic status, 11 percent are in the second quartile, 17 percent are in the third quartile, and only 3 percent are in the bottom quartile.²²

Higher Education as Job Training

Some fear that the increasing economic value of a college/university education may force a choice between narrow economic needs and broader educational goals and that the result will be a commodification of higher education. They make an important point. The temptation to

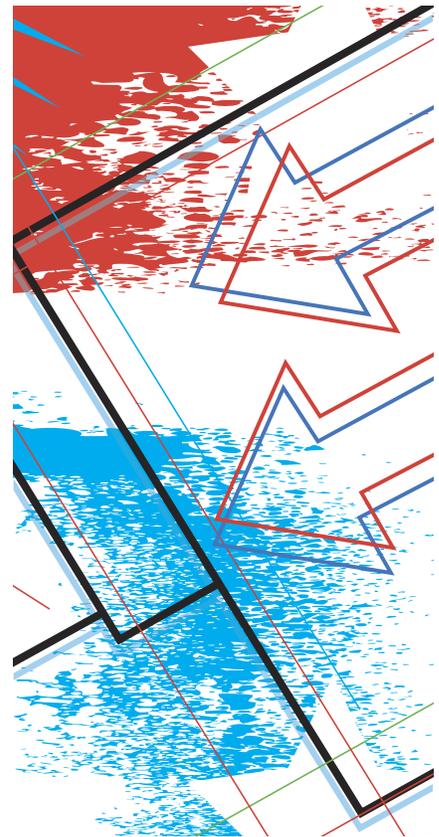
provide narrow vocational training rather than more general learning is strong in a market economy, especially in our current resource-poor environment.

But the distinctions between general education and specific training are becoming increasingly artificial. If *the commodification of college education* is taken to mean investing in narrow occupational training, that would be bad economics as well as bad education. The economic value of general competencies, such as problem solving and critical thinking, is growing along with the growth in demand for job-specific competencies. Although specific occupational skills have greater short-term economic value, more general skills have long-term latent value. General competency leavens all subsequent learning and practical experience. It is the educator's version of patient capital or long-term human capital investment.

The students get it. According to a UCLA survey of college students, 85 percent said the primary reason they go to college is to have a successful career. But a similar share said they go to college to pursue intellectual interests. Meanwhile, 70 percent said they go to college to pursue a general education and to gain an appreciation of ideas.²³

The demand for a more robust combination of specific and general skills is gradually erasing the difference between education and training and argues for more of both in a growing share of curriculum. Most jobs now require preparation that sounds a lot more like liberal education and professional education than narrow job training. Postindustrial careers are defined by unique sets of applied knowledge, values, skills/interests, and personality traits that far exceed the narrow training programs characteristic of a bygone industrial era.

We need to aspire to a dual bottom line in college curriculums: a pragmatic balance between the college's growing economic role and its traditional cultural and political independence from economic forces. Ultimately, however, the economic role of postsecondary institutions—especially their role in preparing American



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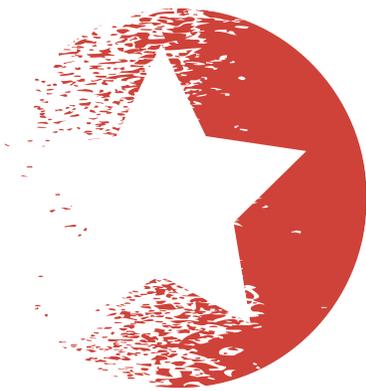
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youth for work and in helping adults stay abreast of economic change—is central. The inescapable reality is that ours is a society based on work. Those who are not equipped with the knowledge and skills necessary to get and keep good jobs are denied full social inclusion and tend to disengage from the mainstream culture, polity, and economy. In the worst cases, those who suffer from years of unemployment and underemployment can be drawn into alternative cultures, political movements, and economic activities that are a threat to the mainstream democratic capitalism.



The Fairness Question

In general, Americans seem happy with postsecondary education's more powerful economic role, which suits our individualist and market biases. Using education to allocate opportunity is popular because it provides a third way—between the inequalities that come with doctrinaire market fundamentalism and the personal dependency that comes with an expanded welfare state. It promises opportunity based on individual merit. We welcome our increasing reliance on education as a source of upward mobility because, in theory, it allows us to expand opportunity without surrendering individual responsibility. After all, we each have to do our own homework to make the grades and ace the tests that lead to the good jobs—and that seems fair.

But is that fair enough? Not really. In a society where people start out unequal, educational opportunity—especially postsecondary educational opportunity

dictated by test scores and grades—can become a dodge, a way of laundering the found money that comes with being born into the right bank account or the right race. As social science has proven, the meritocratic basis of education is, at least in part, a social construct. Education is itself stratified by race and class, ultimately creating a hierarchy of educational inclusion that confers public and private power over others. A vote is not worth nearly as much personal power over others as is a college degree leading to a well-paid professional occupation.

Testing and all the other metrics that allocate educational opportunity are

traditional students is a bittersweet story. Colleges are providing greater access for the least-advantaged students and nontraditional students, but increasing access comes with growing economic, demographic, and funding stratification. The demographic, class-based, and resource-based polarization between two-year and four-year colleges matters because resources matter. The 468 most selective four-year colleges spend anywhere from two to five times as much per student as do two-year schools. Every new student at a selective four-year college brings more than enough new revenue. New students pay enough tuition

Postsecondary education—especially access to selective colleges and to graduate and professional education—sits at the pinnacle of the hierarchy that joins education and careers.

better social indicators of our collective failure to provide equal opportunity than measures of innate individual merit or deservedness. For most low-income kids, there is no systematic relationship between innate potential measured in childhood and aptitudes developed by the time they are old enough for college. Conversely, most of the difference in the developed aptitudes among college-age middle- and upper-income adolescents can be accounted for by measured differences in their innate abilities when they were children.²⁴

Postsecondary education—especially access to selective colleges and to graduate and professional education—sits at the pinnacle of the hierarchy that joins education and careers. As such, it reflects the tension between educational merit and opportunity at its highest and most exquisite pitch, a fact that ensures that access and equity issues are here for the long haul in postsecondary education, with no easy solutions in sight.

The growing access to college for minorities, low-income, and other non-

to cover themselves and to maintain high spending levels per student. At open-admission four-year and two-year colleges where minority and lower-income students are concentrated, new students represent a fiscal burden. They don't bring enough tuition aid or state support to pay for themselves, and each new enrollee reduces spending per student. Even among students with the same test scores, higher per-student spending in the four-year colleges leads to better outcomes than for similarly qualified students who attend the overcrowded and underfunded two-year schools.

Overcrowding and underfunding is the willfully unnoticed elephant in the room in the policy dialogue on the future of the community college. Community college spending per student is far below four-year college spending. But these differences are only the tip of the iceberg in the resource inequality problem between two-year and four-year institutions. Because of the special needs of their students, community colleges need more than equal funding. They need

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The growing racial, ethnic, class, and resource divide is turning the U.S. postsecondary system into a dual system of separate and unequal institutions. Polarization by race, class, and ethnicity has become the capstone for K-12 inequality and the complex economic and social mechanisms that create it. The postsecondary system mimics and magnifies the inequality it inherits from the K-12 system and then projects this inequality into the labor market.

Postsecondary education has become one more gearwheel in the workings of the powerful economic and educational mechanisms that determine the odds in a modern economy. These mechanisms

that are impervious to narrow solutions and that require a much more serious commitment to equal opportunity and upward mobility than we see seem able to muster in our politics.

The postsecondary system is increasingly complicit as a passive agent in the systematic reproduction of economic and white racial privilege. Across generations, the cycle of privilege has become self-reinforcing. More college completion among white and affluent parents brings higher earnings. Higher earnings buy more expensive housing in the leafy green suburbs with the best schools and peer support for educational attainment. The synergy between the growing economic value of education and the increased sorting by housing values makes parental education the strongest predictor of a child's educational attainment and future earnings. As a result,

to liberal education for all races and classes are necessary for full citizenship in a capitalist economy.

Both liberal education and work education need to be improved. Liberal education is too often a set of cafeteria choices with little coherence. But the need to align college curriculums with labor markets is probably the most urgent task in higher education reform. Hippocrates was right: "Art is long, and life is short, opportunity fleeting." Individual human flourishing, the essence of liberal learning, is a lifelong endeavor that barely begins in college. Defining human flourishing is an ambiguous task at best. The effect of college field of study on career pathways and earnings is much more immediate and more easily addressed empirically. We can trace the relationships between college programs,

The right to an education with labor market value and also access to liberal education for all races and classes are necessary for full citizenship in a capitalist economy.

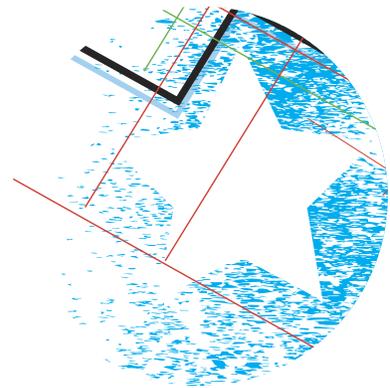
are color-blind and class-blind in theory but not in fact. They are nested together in ways that make their combined negative effects mutually reinforcing, resilient, and superficially legitimate as barriers to opportunity. They persistently produce educational and economic outcomes that have a disparate negative impact on African American, Hispanic, and low-income students.

We have arrived at a point where our racial, ethnic, and class inequality is primarily driven not by the vulgar motivations of Jim Crow racism or class bias but by race- and class-neutral economic and educational mechanisms that ultimately have the same effect as race or class animus. Disadvantage, like privilege, in society is now driven by a complex set of mutually reinforcing mechanisms

according to the OECD data, the country also has the least intergenerational educational mobility among advanced nations.²⁵

Transparency, Efficiency, and Equity

Postsecondary education requires more money for more efficiency, more equity, and more transparency. We cannot afford all the postsecondary education we need without more efficiency, and we cannot achieve more equity without more efficiency. Postsecondary education has become the keystone in connecting economic opportunity to the rights of citizenship. In the industrial economy, civil rights and a job were enough. Now, the right to an education with labor market value and also access

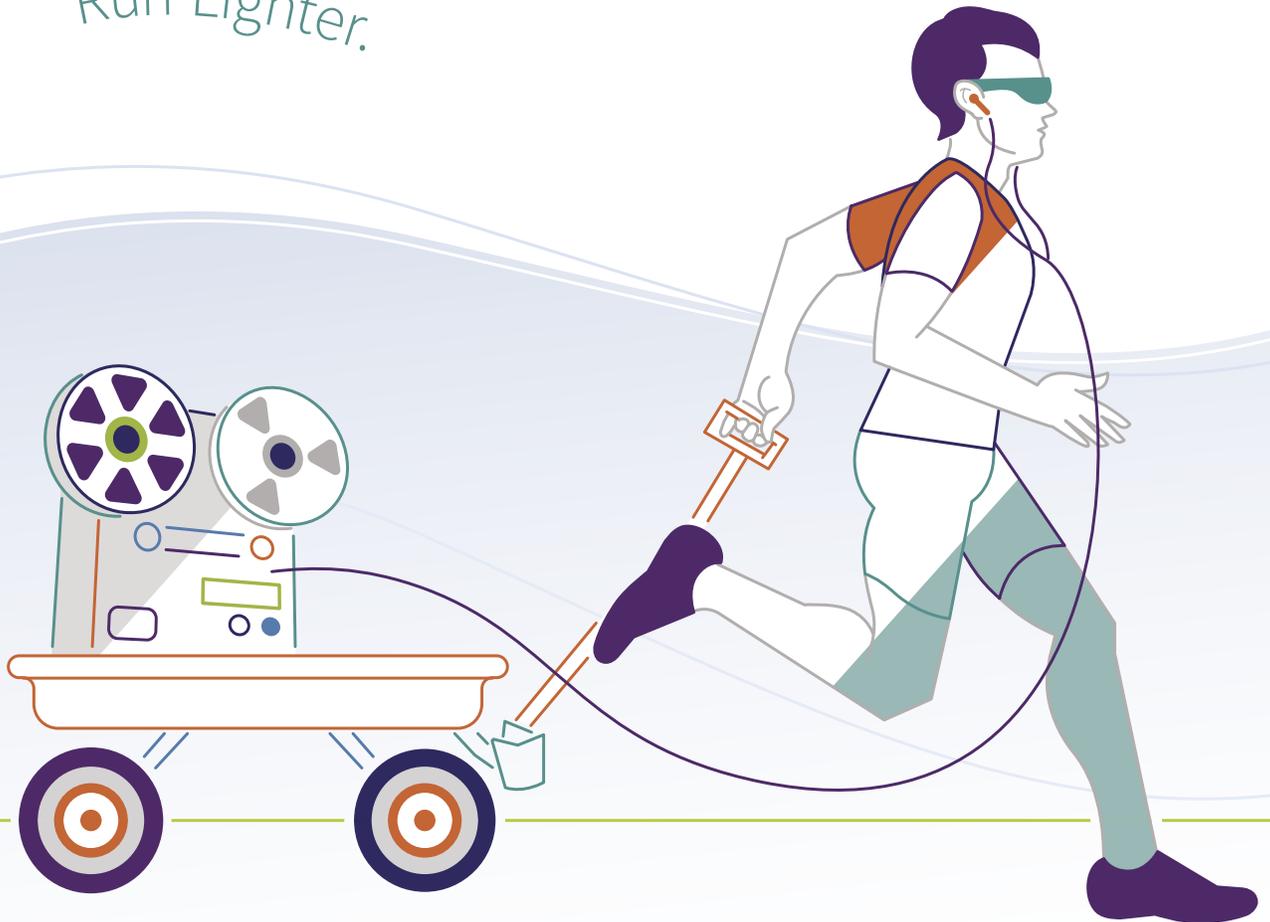


occupational pathways, and earnings with relative ease due to the recent advances in administrative data.

The interface between higher education programs and labor markets has become a Tower of Babel. The number of occupations identified by the U.S. Census Bureau has grown from 270 in 1950 to 840 in 2010.²⁶ Meanwhile, the number of programs of study offered by colleges and universities grew from 460 in 1985 to 2,260 in 2010.²⁷ And every one of those occupations requires a distinctive mix of knowledge, skill, abilities, work values, work interests, work formats, and personality traits.²⁸

The transparency needed for postsecondary education begins with tying

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individual postsecondary programs to both learning and earnings outcomes. Students and parents have recognized the new economic reality, and the result has been an incredible surge in demand for all kinds of postsecondary education and training programs. There have been record enrollments across all institutions of higher education and an explosion in programs. Unfortunately, there has not been a concomitant growth in the availability of information to help students make good choices about the education and training they need, and for what kind of jobs. The dizzying array of postsecondary education and training providers has made the task for consumers much more difficult. The higher education market has become increasingly complicated and difficult to navigate.

The higher education mission endures, but times change. The choice between general and specific education is not a zero-sum game. The economic value of a college education and work training has added a new emphasis to the broader postsecondary mission. In a modern republic, the higher education mission is still to empower individuals to live fully in their time, but those individuals also need to be able to live free from the worst versions of economic or public dependency.

The dual role of higher education in serving both human flourishing and economic empowerment has also become one of the keystones in the social contract—the new deal—between democracy and capitalism. But there is not likely to be any “one size fits all” solution. Higher education must serve many masters at once. T. H. Marshall’s simple pragmatism in his closing remarks in his 1949 lecture on “Citizenship and Social Class” still serves us well today, as we struggle with the relationship between education and the economy: “The main features of the system are inevitable, and its advantages . . . far outweigh its incidental defects. . . Apparent inconsistencies are in fact a source of stability, achieved through a compromise which is not dictated by logic.” He added: “A

human society can make a square meal out of a stew of paradox without getting indigestion—at least for quite a long time.”²⁹ ■

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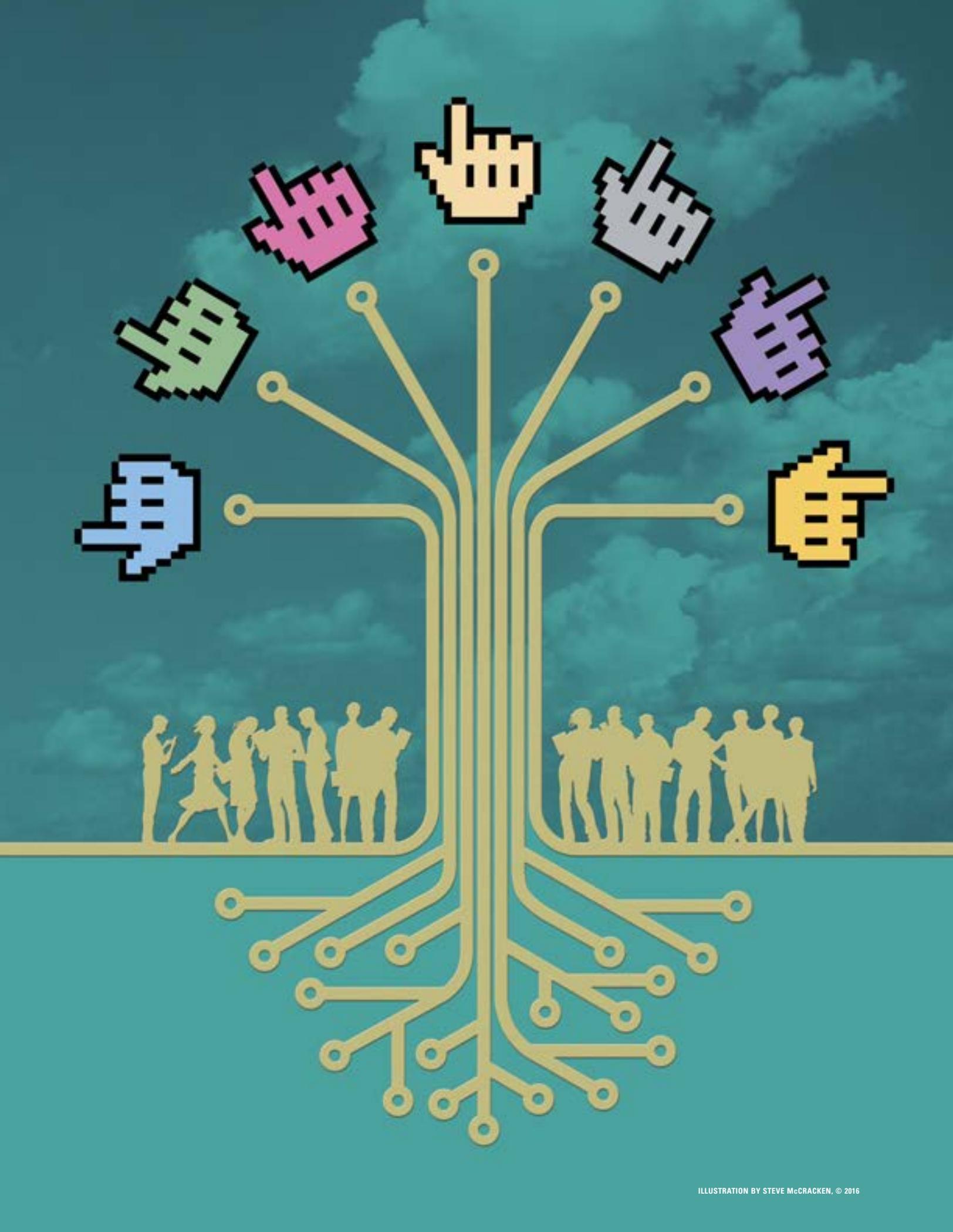
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OPTIMIZING TECHNOLOGY'S PROMISE

Brenda J. Allen

In 1989, I was recruited to the University of Colorado Boulder as a “twofer.”¹ Because I am black and female, they could count me in two categories of diversity. This mattered because the university was striving to increase numbers of diverse faculty. At that time, I had been teaching a course, Computers and Society, at Howard University in Washington, D.C. The course was designed to help students understand the growing role and potential impact of computers in the world. I also was completing my dissertation in organizational communication studies. My research centered on how organizations adopt new computer-mediated communication technologies, specifically a brand-new technology known as *electronic mail*. I came to Colorado to teach and to continue my research in that area.

However, not long after I arrived, I became intrigued by campus dynamics related to identity, especially in terms of race and gender. Within a few years, I changed my research focus to social identity, which has remained my primary area of scholarship and teaching. Back then, I hoped to combine my original interest in technology with issues of diversity. I even described myself as a 21st-century organizational communication scholar who looks at two significant issues facing future organizations: diversity and technology. I did not follow through on that vision. However, I expanded the scope of diversity to encompass not only gender and race but also categories such as ethnicity, social class, sexuality, ability status, nationality, age, and the intersections of all of these, with a focus on equity in higher education. I have maintained my interest in information and communication technology. In fact, I'm usually the first (and often the only member of the leadership team on my campus) to adopt the latest device or app for professional and personal use.

So I am pleased to return here to the idea of exploring diversity and technology by considering this guiding question: How can we optimize the promise of technology in service to an increasingly diverse society? More specifically, what are implications of that promise for using technology for teaching and learning? Although these questions matter for higher education around the world, I will concentrate on implications for the United States.

Let's clarify our terms. First, *optimize* means to make something as effective, perfect, or useful as possible. Next, how do we define *technology*? Etymologically, the word *technology* is from the Greek *tekhne*: "the systematic treatment of an art, craft, or technique." In this sense, technology concerns the ways in which we systematically engage with the world. When I was teaching the computers and society course, I relied on a definition from media theorist Marshall McLuhan, who said: "I think of technologies as extensions of our own bodies, of our own faculties—whether of clothing, housing, and more familiar kinds of technologies like wheels, stirrups, and

such, extensions of the various parts of the body. The need to amplify the human powers in order to cope with various environments brings on these extensions, whether of tools or furniture. These amplifications of our powers, sorts of deification of man, I think of as technologies."² Thinking of technologies as extensions and amplifications of our powers has intriguing implications for how we use them for teaching and learning. For instance, from whose bodies and whose faculties do technologies tend to extend, and what powers do we strive to amplify? Although McLuhan's definition encompasses a wide range of possibilities, we will concentrate on information and computer technology.

Promises, Promises

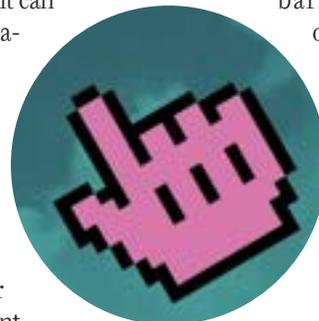
To optimize the promise of technology for teaching and learning, we need to specify what we think it can do. Considering implications for diversity, I'm reminded of the words of American theologian Richard Shaull. In the foreword to Paulo Freire's book *Pedagogy of the Oppressed*, Shaull wrote: "Education either functions as an instrument which is used to facilitate integration of the younger generation into the logic of the present system and bring about conformity to it, or it becomes 'the practice of freedom,' the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world."³

To achieve the latter, we can use technology to democratize education, personalize pedagogy, authorize and equip students to control their own learning, move our schools and our educa-

tional systems out of the Industrial Age, prepare students for an increasingly multicultural world, and improve efficiency in teaching and learning. Moreover, because technology can provide access to more information and more data than ever before, it shows promise for removing boundaries and providing access to growth and learning for literally everyone. As Jamie Lathan (dean of distance education and external programs at the North Carolina School of Science and Mathematics, a magnet school in Durham) observed, technology "makes learning and teaching more flexible and accommodating and makes up for deficiencies in the society."⁴

Barriers

To attain the promises of technology cited above, we must hurdle many barriers, especially barriers of access. For instance, Jan van Dijk framed access as a multifaceted concept that includes four types of access: motivation; physical and material; digital skills; and, usage. Whether or not someone is *motivated* to access technology depends on variables such as amount of time to engage with technology, technical knowledge, financial resources, cultural norms, and social relationships or networks that encourage or discourage use. *Physical and material* access refers to literal access to technology. Categories of *digital skills* include operational, formal, informational, content-creation, and strategic. *Usage* comprises amount and variety of use. Van Dijk notes that although motivation and physical access have increased in developed countries, digital skills vary widely, as do types and amount of usage. He describes a persistent and



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growing digital divide that consists of “increasingly complex social, economic, and cultural differentiation” with detrimental implications for members of underrepresented groups (e.g., those in a lower social class, racial-ethnic minorities, and immigrants).⁵

Distinctions in access and the digital divide are particularly relevant to a prevailing attitude among some educators, those who refer to students’ constant use of technology without knowing what they are using, how they are using it, or how well they are using it. This point is further exemplified in “Digital Literacy in 2015,” which states that although one in four millennials want to improve their digital literacy, 37% view the Internet as “scary”—a higher percentage than respondents ages 35 and over.⁶

In addition, access assumes that a person not only knows a technology (and what it offers) exists but also has the propensity and the curiosity to discover and use the technology wisely. This is again pertinent to some educators who may resist adopting technology for teaching and learning based on limited or dated information about that technology. In addition, some of them seem to dismiss students’ use of certain technologies without experiencing those technologies for themselves. As an example, during a recent week-long faculty seminar, one of the younger participants persuaded me to download *Pokémon Go*. I loved it, and I was surprised when I realized it has potential for teaching and learning (e.g., to learn about historic landmarks). I was pleased to learn that some educators are exploring how to use this game to enhance their teaching.⁷

Challenges/Opportunities

Now that we have considered some of the barriers related to optimizing technology’s promise, let’s delve into challenges and opportunities related to diversity in higher education.

Diversity Matters in Higher Education

Institutions of higher education are increasingly addressing diversity as an

ethical imperative to provide access for traditionally disenfranchised groups and to be more inclusive. They often aim to hire more faculty and staff from underrepresented groups and to prepare all students to be educated global citizens who can interact effectively in multicultural contexts. Some of them recognize and seek the bottom-line benefits of diverse workforces and student bodies: enhanced productivity, creativity, innovation, loyalty, and improved morale. Thus, diversity has also become an economic imperative and an economic asset in higher education.

Many institutions are implementing programs designed to foster success for diverse students. An example is the Equity Scorecard approach, which invites institutions to take responsibility for racial-ethnic differences in students’ performance in core courses such as writing and math by applying proven practices that include helping faculty and staff to examine and revise their instructional and academic support practices.⁸ Colleges and universities are also trying to be proactive about social, legal, and political issues such as race-based college admissions policies, immigration debates, same-sex marriage laws, police shootings of African Americans, transgender rights, Islamophobia, and domestic and international acts of terror, as well as a rise in student protests about these matters.

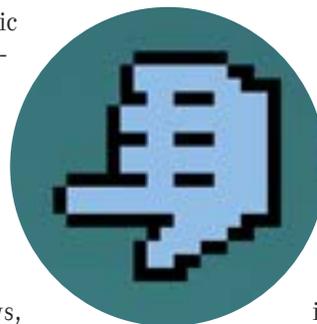
A growing body of research provides direction for meeting these and other challenges. Promising practices include crafting and executing strategic plans to build institutional capacity for diversity. This approach advocates framing diversity as an institutional priority

and cultivating inclusive learning and work environments for *all* faculty, staff, and students. It also advises providing professional development to faculty and staff on topics such as implicit bias, which can have negative implications for members of underrepresented groups. To facilitate these processes and practices, many institutions are creating or reassigning diversity officer positions in executive-level roles.⁹

Diversity also has a bearing on other, related developments in higher education. For example, a *Chronicle of Higher Education* report entitled 2026, *The Decade Ahead* notes a surge in college/university enrollment over the past four decades, due largely to perceptions that a degree is a ticket to financial success and that the country needs to be more educated. The report notes that the rising costs of higher education may prohibit certain students from attending college.¹⁰ Moreover, even when students gain access, their likelihood of graduation varies according to race and socioeconomic status. Although college graduation rates in the United States have risen overall, with 40% of the population ages 25 to 64 having a degree, the rate is 27% for blacks and 20% for Hispanics.¹¹ Additionally, a

44 percentage point gap exists between wealthy students and poor students who earn bachelor’s degrees.¹² And, numbers of college/university dropouts have increased.¹³ These achievement gaps lead to earning gaps with grim implications for the ability of the United States to prosper and to be competitive globally. These statistics reveal a widening gap between the haves and the have-nots in the United States, as further seen in

Access assumes that a person not only knows a technology (and what it offers) exists but also has the propensity and the curiosity to discover and use the technology wisely.



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demographics related to students and faculty.

Students Today and Tomorrow

The main market for college/university applicants continues to be 18- to 22-year-olds. However, that is changing as more working adults enter higher education. In addition, the racial-ethnic composition of prospective students is shifting. By 2020, “more than half of the nation’s children are expected to be part of a minority race or ethnic group,” according to the U.S. Census Bureau, referring to children under the age of 18.¹⁴ 2026, *The Decade Ahead* foretells a U.S. regional supply-demand mismatch, characterized by areas in which numbers will decrease significantly while other areas can expect more growth. The area of the country projected to witness the most growth is the South—especially Texas. This projection is significant because of the high number of Latino/Latina students in that region. Drops in numbers of students in other areas of the country also are tied to race. In places where the number of white students is declining, institutions accustomed to mainly white applicants will no longer have that deep pool from which to draw.¹⁵ Moreover, due to racial differences in high school graduation-attainment rates, a higher proportion of students of color than white students will not even be eligible for college. In Colorado, for example, high school graduation-attainment rates are 83% for whites, 70% for African Americans, and 65% for Hispanics.¹⁶

Although forecasts about student diversity in higher education usually emphasize a “new majority” of persons of color in the United States, we also should be mindful of other demographics, including the growing numbers of veterans, students with disabilities who have received mainstream K-12 education, international students, and immigrants (documented and undocumented) who aspire to attend college. Also, many students will be the first in their family to seek a college degree.

Thus, the pool of prospective students will probably become progressively more diverse.

Faculty Today and Tomorrow

The professoriate is graying. At many institutions, baby boomers (born between 1946 and 1964) compose 25% of tenure-track faculty, and many are approaching the age of 70.¹⁷ Most of these older tenured faculty (like me) are staying on the job. Because many of these faculty members have been at their institutions for a long time, their salary affects the overall salary pool, thereby forcing institutions to rely more heavily on non-tenure-track faculty, who are paid less. Almost 50% of faculty are non-tenure-track and part-time, leading to a bifurcation in which older faculty are mostly tenured and younger faculty are part-time and not on the tenure track. Tenure-track faculty now make up less than one-third of the faculty; in 1969, they accounted for 80%.¹⁸

In addition to age, faculty members’ race matters. In fall 2013, of all full-time faculty in degree-granting postsecondary institutions, 79% were white (43% white males and 35% white females), 10% were Asian/Pacific Islander, 6% were black, and 5% were Hispanic. Among full-time professors, 84% were white (58% were white males and 26% were white females), 9% were Asian/Pacific Islander, 4% were black, and 3% were Hispanic.¹⁹ As these statistics imply, gender differences also count. For example, women and underrepresented minorities are disproportionately represented in non-tenure-track roles.²⁰ Moreover, similar race and gender disparities exist within the ranks of higher education IT staff and leadership.²¹

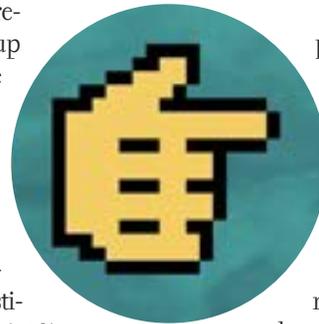
The Status Quo

The preceding discussion about diversity in higher education has powerful implications for how we might optimize the promise of technology in service

to an increasingly diverse society (and therefore student body). In addition to contrasts between generations, we must attend to glaring racial-ethnic differences between prospective students, as well as race, ethnicity, gender, age, and rank distinctions among faculty. These differences are significant to how we recruit, retain, teach, evaluate, mentor, and advise students. Moreover, they can impact the future of the professoriate. We should strive to cultivate the next generation of faculty among the richly diverse group of students who will be entering our colleges and universities. Their interest in such a career path will depend on how responsive faculty in all ranks seem to be to their needs and identities and on how attractive the role seems to be. We also should be aware of differences in technology experiences and expectations

between and among faculty and students as implied in van Dijk’s model of access. If we don’t know what to look for and think about, we might maintain the status quo.

In addition to contrasts between generations, we must attend to glaring racial-ethnic differences between prospective students, as well as race, ethnicity, gender, age, and rank distinctions among faculty.



Trends

Examining trends in technology provides additional guidance for how we might proceed. Massive Open Online Courses (MOOCs) are an important development in higher education. Although they have not drawn students away from traditional institutions (as anticipated), they seem to have affected

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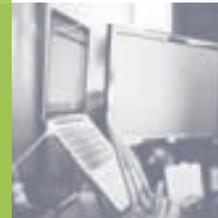
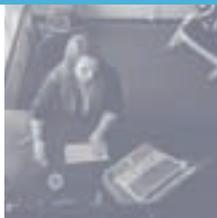
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faculty approaches to teaching and learning. As some faculty implemented MOOCs, they began to reflect on *how* they teach. Edward Maloney, executive director of Georgetown University's Center for New Designs in Learning and Scholarship, notes: "The MOOC momentum pushed people to think about teaching in ways they hadn't before. That's a huge shift."²² Consequently, some institutions are experimenting with teaching strategies such as fewer lectures and shorter blocks of discussion time. They also are working with "flipped classrooms," which use technology to move "the more passive elements of learning (watching a lecture, reading a chapter, etc.) outside of the classroom, so that more class time is available for interactive, hands-on learning." In addition, they are applying technology to collect, track, and aggregate real-time data about students' learning and about how students interact with classroom technology.²³

A MOOC example that informs this discussion is the Global Freshman Academy at Arizona State University. Last year, they partnered with edX to allow students to try out college with limited risk. They offer online freshman-year MOOCs available worldwide, with no admissions process, for full university credit. Students pay and apply for credit after they successfully complete classes. Although this approach could widen the gap between wealthy and low-income students, it also might bolster the confidence of low income and first-generation students. Also of note, this program is using adaptive learning software in its introductory college algebra course—the

first time that product has been used for a MOOC.²⁴

The *NMC Horizon Report: 2016 Higher Education Edition* describes a variety of other ways that institutions are employing new technologies in teaching and learning. It discusses key trends accelerating technology adoption, significant challenges impeding technology adoption, and important developments. Although I can discern implications among all of these for valuing diversity, a few are especially noteworthy. One key trend for 2016 is "rethinking how institutions work," which stems from the premise that higher education is undergoing a long-term transformation. Contending that traditional systems may be inefficient for nontraditional students, one feature of this trend is to explore alternative modes of delivery

and credentialing to adjust to students' diverse needs. Institutions are experimenting with emerging models like hybrid learning and competency-based education.²⁵

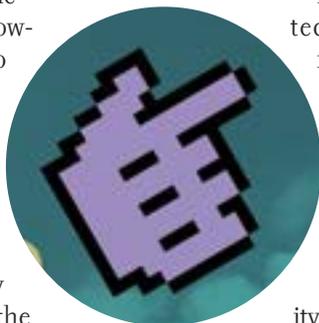
Among challenges, the need to improve digital literacy stands out. The report notes that this new category of competence is "affecting how colleges and universities address literacy issues in their curriculum objectives and teacher training programs." It echoes an earlier point that although students may seem more digitally literate than their predecessors because they have been entrenched in technology-rich contexts, research reveals that they may not be as confident in using technology in higher education contexts. To address digital literacy effectively, institutions will need to consider the heterogeneity of students and faculty as

implied in the demographics cited earlier. Another interesting development is BYOD (Bring Your Own Device, also referred to as BYOT, or Bring Your Own Technology): staff, students, and faculty bring their own laptops, smartphones, tablets, or other portable devices (e.g., smartwatches, wearable devices, and smart objects) with them to their learning or work environments.²⁶ The report also cites new pedagogies and active learning models that promote hands-on and student-centered experiences that also use technologies with which students are familiar. For example, marketing students at Indiana University used Instagram for campaign projects, and San Jose State University collaborated with Facebook to expose young women to computer science.²⁷

Colleges and universities also are implementing new models for faculty engagement with teaching and learning technology. 2026, *The Decade Ahead* describes a design-build approach in which a faculty member works with an instructional designer, citing it as one of the hottest jobs in higher education today.²⁸

Another trend in technology use in higher education involves big data analytics—that is, examining huge data sets to discover patterns, correlations, client preferences, and other useful information. Georgia State University is applying big data analytics to help its diverse student body. Of its 32,000-plus students, 56% receive federal Pell Grants, 60% are nonwhite, and 30% are the first in their family to attend college.²⁹ The institution has striven to create a "culture where numbers matter," using data to advance student success. It has developed sixteen programs focused on student retention and graduation. This collaborative effort has helped the university "better serve individuals straying from the track to graduation. By directing more resources to students in the 'murky middle'—not just those at the top or bottom of their class—they've created a more strategic advising program, significantly narrowed the achievement

Although students may seem more digitally literate than their predecessors, research reveals that they may not be as confident in using technology in higher education contexts.





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gap, and improved graduation rates." The initiative has yielded impressive economic consequences: the institution saves \$3,000,000 for every 1% improvement in retention rate.³⁰

Recommendations

Now that I have shared selected information and insights in response to our guiding question—"How can we optimize the promise of technology in service to an increasingly diverse society?"—I will conclude with recommendations for institutions and individuals.

Institutional-Level Recommendations

My primary recommendation is for offices that are responsible for separate areas of diversity, teaching and learning technologies, and faculty development within their institutions to work with one another. They should compare, contrast, and converge processes, principles, and practices to develop and implement resources, policies, student-centered initiatives, and professional development opportunities for faculty and staff. For example, to develop resources for digital literacy for faculty, staff, and students, they might incorporate best practices based on knowledge about cultural and generational differences in learning styles combined with insights from van Dijk's model of technology access.

Institutions also need to develop and implement strategic plans for (1) enhancing diversity and (2) being proactive in applying technology for teaching and learning. The latter might be included in a digital strategic plan that includes other aspects of technology use within the institution. These strategic plans should incorporate data-driven approaches such as big data analytics and the Equity Scorecard. They should provide resources and reward faculty and staff to engage in capacity-building efforts while also holding them accountable (e.g., through merit evaluations). In addition, these plans should offer training to faculty and staff on topics such as how to disrupt implicit biases that may influence hiring decisions, how they interact with students and

colleagues, as well as their decisions about how and whether or not to use teaching and learning technologies. Regarding diversity and education, institutions should infuse diversity throughout the curriculum, rather than limiting learning about diversity to single courses. They also should encourage and value research that advances knowledge and practice related to diversity as well as teaching and learning technologies. These ideas stem from research about utilizing an organizational development framework to transform higher education.³¹

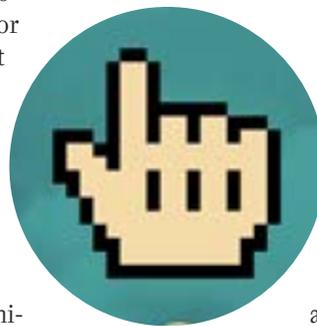
Institutions also should develop partnerships with edtech companies for mutually beneficial purposes. Companies can consult with administrators and faculty to discern how the companies can help them to accomplish relevant strategic priorities. Institutions can also collaborate with edtech companies to develop recruiting processes (e.g., internships or experiential learning) that can result in diversifying the companies' workforces. Given current and projected demographics, to be competitive, edtech companies need "to understand the challenges and opportunities of a diverse student body, and part of that understanding is a commitment to inclusive hiring and leadership development."³² Furthermore, referring to McLuhan's notion of technology as extensions, this strategy might help edtech companies to develop products and content that incorporate perspectives and preferences of underrepresented groups rather than those of persons who have dissimilar backgrounds.

To optimize the promise of technology in service to an increasingly diverse society, we will need to prepare all faculty

and staff to be proactive in both areas—technology and diversity—separately and combined. Institutions should provide professional development that helps faculty effectively use the growing array of technologies to teach students from diverse backgrounds. Faculty also deserve professional development that will help them improve their teaching skills to be more inclusive and culturally responsive. In an ideal situation, they will have opportunities to delve into both topics simultaneously. Non-tenure-track faculty should be included in these endeavors, not only because they are providing a high percentage of teaching service, but also since they tend to be more diverse than tenured faculty. Consequently, they may offer important insights on inclusive practices. Moreover, staff (including high-level administrators) also should receive professional development in both areas as relevant to their roles. Finally, institutions should encourage and incentivize research projects that help to advance knowledge and practices about teaching and learning technology and diversity, separately and combined.

At CU Denver, Margaret Wood, director of the Center for Faculty Development, and I have established a partnership to provide faculty with professional development related to diversity and inclusion. In addition, Wood plans to appoint a teaching fellow from the School of Education and Human Development to focus on inclusive teaching and learning, beginning with two half-day sessions in October; these sessions will help faculty to develop concrete strategies for inclusive teaching through classroom practices, course design, and both formal

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and informal interactions with students. The center is also offering numerous “Appy Hour” workshops on using contemporary technology, including Snapchat, Jing, Snagit, and ThingLink, for teaching and learning. Thanks to what I’ve learned recently about technology and diversity, I will ask Wood to collaborate with me on developing resources that focus on both topics. I also will invite colleagues from our Office of Information Technology to join us. In addition, I plan to actively involve students in these and other endeavors.

To achieve the ambitious goals implied in these recommendations, institutions should invite students’ input, solicit their feedback, and empower them to initiate change. For example, due in part to affirming relationships between student leaders and members of the chancellor’s cabinet, our Student Government Association submitted a resolution last year to our faculty assembly that cited students’ need for a comprehensive understanding of diversity issues as well as gaining a tangible competitive advantage as leaders within their professions. They requested that all faculty receive professional development to help them engage effectively and humanely with our diverse student body and to better prepare students for an increasingly multicultural world.

Individual-Level Recommendations

For institutional initiatives and strategies to succeed, individual faculty and staff

must do their part. Moreover, individuals should not wait for the institution to try to effect change. In case you have not considered or are not engaged in any of the following, I invite you to consider these recommendations. Focus on the “learning” part of teaching and learning. Learn about promising practices and new teaching and learning technologies. Also, try to be familiar with the types of technologies that students at your institution tend to use socially and for educational purposes. If you are a faculty member, ask students about the technologies they use, and invite them to co-create learning experiences using those technologies. After all, if you don’t know what a technology is all about, you can’t critique or judge it appropriately, nor can you make informed decisions about how to use it for teaching and learning. If you are an innovator or early adopter of technology, share your insights with your colleagues.

Learn about diversity demographics at your institution and in your area. Become more committed to acknowledging, appreciating, and advancing diversity in all aspects of your role. Work within your spheres of influence to help your department and your institution attain the promise of diversity. Request or offer professional development and resources to build capacity for diversity, including methods for creating more inclusive and respectful workplaces. Such environments will enhance the likelihood of reaping the benefits of diversity.

Conclusion

I encourage you to work toward achieving Shaull’s vision of education as “‘the practice of freedom,’ the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world.”³³ Become more thoughtful, more heartfelt, and more committed in terms of what you have to offer and what we have to gain. Let’s take action to optimize the promise of technology in service to an increasingly diverse society for the betterment of higher education and student success, the betterment of our own quality of work-life, and therefore the betterment of the world at large. ■

Notes

This article is an extended version of the keynote address delivered at the Colorado Learning and Teaching with Technology (COLTT) Conference, August 3, 2016.

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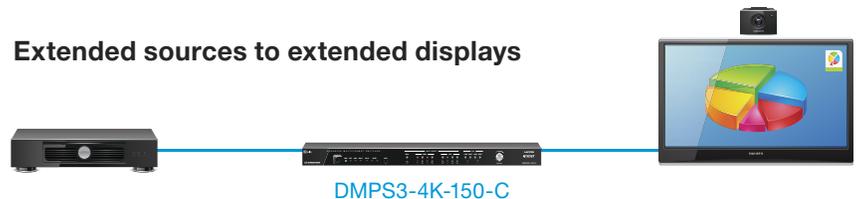
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FREEDOM, PERMISSIONLESS INNOVATION, AND A SUCCESSFUL INTERNET

Erik Huizer

What is freedom? It's not simply the right to be able to do and say whatever we want. Freedom is also about respecting the fact that *everybody* has that right. Freedom is about taking other people into account, and doing so in such a way that every individual can thrive and develop safely.

The Internet can help every individual thrive and develop safely. Vint Cerf, generally recognized as one of the “fathers” of the Internet, says that “permissionless innovation” is the Internet's greatest asset.¹ Indeed, the unbridled innovation of the Internet has been made possible by the high degree of freedom it enjoys. The innovation of the Internet can be subdivided into (roughly) four categories: infrastructure, equipment, services, and applications.





Thanks to app stores like those from Apple and Google, there has been a “democratization” of applications, which are now called apps, and the speed of innovations in this field has increased beyond recognition.

All in all, this results in an extremely positive dynamic in which the essential features of the Internet—collaboration and accessibility—enable the most unexpected developments, with no restrictions or impediments. That’s the creative freedom of permissionless innovation.

The Internet as an Anarchy

How is the Internet organized and governed? Is it an anarchy, as many people claim? I would argue that the Internet does have anarchic tendencies: there is no central Internet authority and there is no Internet police telling you what you can and cannot do. But it’s certainly not an anarchy: there is definitely a degree of organization (even though, yes, it’s a loose kind of organization).

To understand the way the Internet is organized, we should define it. In

The essential features of the Internet—collaboration and accessibility—enable the most unexpected developments, with no restrictions or impediments. That’s the creative freedom of permissionless innovation.

- *Infrastructure* forms the basis but, at the same time, is the least visible. Indeed, it is so invisible that my teenage kids don’t even realize there is an infrastructure and that it has to be paid for, managed, and maintained. Innovations in this field come from major and minor Internet providers and are mainly driven by ISPs, equipment suppliers, nonprofit coordinating bodies (such as ARIN) and research networks such as SURFnet and Internet2.
- *Equipment* is the “sexiest” category. Innovations in this field lead to queues of people waiting outside shops to snap up the latest gadget. Innovations in computers, laptops, tablets, and smartphones are the domain of big corporations like Samsung and Apple. These companies

innovate constantly in order to keep their devices appealing. That is their business model. And then sometimes there’s an external stimulus, such as the Phonebloks created by Dave Hakkens.

- *Services* are no longer the exclusive domain of companies, ever since the development of the World Wide Web (WWW) in the early 1990s. On the Internet, anyone with an idea and dedication can start providing a service, such as an online shop, and make it a success. Innovation in this field is a wonderful mix of private individuals, start-ups, public authorities, and large corporations.
- *Applications* require the development and sale of software and as a result were, for a long time, the preserve of companies and public authorities.

1992, when the web came into being, the Internet Engineering Task Force (IETF), the organization responsible for Internet standards, defined it as follows (RFC 1310): “The Internet, a loosely-organized international collaboration of autonomous, interconnected networks, supports host-to-host communication through voluntary adherence to open protocols and procedures defined by Internet Standards.”²²

The Internet is a network of autonomous networks that voluntarily interconnect with each other and talk to each other on the basis of Internet standards. You can use protocols other than the Internet Protocol, but other people wouldn’t “understand” you. It would be as if you were speaking Chinese when the rest of the world is speaking English.

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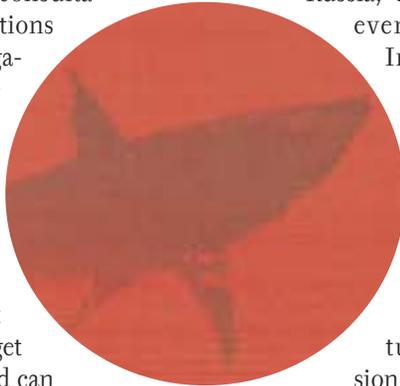
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You can also use the Internet Protocol without connecting your own network to the Internet. Only when you connect your own network and use the Internet standards will your network become part of the Internet. But that doesn't take away the fact that your network is and remains yours.

So, the Internet exists specifically because everyone adheres to the Internet standards. The agreements required to develop, maintain, and implement these standards are not achieved through anarchy; rather, they require a great deal of conciliation and consultation. These consultations are certainly well organized and take place in multi-stakeholder forums such as the IETF (for standardization) and ICANN (for names and addresses). *Multi-stakeholder* means that anyone who wants to get involved can do so and can have their say with as few obstacles as possible. Users and companies, not just governments, are stakeholders. In a multi-stakeholder environment, governments have no more power than other stakeholders.



A Free and Open Internet

The Declaration of Internet Freedom (<http://www.internetdeclaration.org/>) explains why freedom on the Internet is so important. It sums up precisely what the Internet is all about:

We believe that a free and open Internet can bring about a better world. To keep the Internet free and open, we call on communities, industries and countries to recognize these principles. We believe that they will help to bring about more creativity, more innovation and more open societies.

We are joining an international movement to defend our freedoms because we believe that they are worth fighting for.

Let's discuss these principles—agree or disagree with them, debate them, translate them, make them your own and broaden the discussion with your community—as only the Internet can make possible.

Join us in keeping the Internet free and open.

I have signed this declaration because, in my view, it paints an idealistic picture that—however unachievable it may seem—we should always keep in our minds as a goal. Will countries like Russia, China, or North Korea ever give their citizens Internet freedom? As things stand at the moment, this would seem to be a very long way off. The declaration does have a purpose, if only as a trigger for discussion. Fortunately, this discussion is now under way. At the NETmundial meeting in spring 2014 in Brazil, many countries, including Russia and China, agreed on a multi-stakeholder statement that marks a major step in the right direction in terms of Internet freedom and the associated multi-stakeholder governance of the Internet. But as is so often the case, the devil is in the detail. It will be a long time yet before there is agreement on how countries interpret *freedom* and *governance*. Still, as long as we're discussing these issues in a multi-stakeholder environment (and not in a forum dominated by governments), we have a basis on which to build and to grow closer.

The Internet as a Leveler

What do we in the West see as the positive aspects of the Internet? In the first instance, the Internet is a great leveler. As the "Declaration of Internet Freedom" (cited above) states, access to the Internet makes for a more open society in which where you've come from no longer determines what you achieve in

your life; rather, your own intelligence and dedication determine your future. So, for example, in 2012 a 15-year-old boy from Mongolia saw his life take an unexpected turn when his talents were spotted through an online course he was taking at MIT. He received an offer to study there and, at the age of 17, was taken on by members of an MIT/Harvard consortium called edX to help them identify other talented individuals like himself.³

The Internet has also made people more savvy about governments. Previously, we had to rely on a person sitting behind a counter for most government information. Now, not only can we find, by ourselves, a lot of information about and produced by the government; we also can share that information and discuss it with other people. This has forced governments to be increasingly transparent. If governments aren't transparent, the Internet gives people the opportunity to find allies and rise up, as we saw with the Arab Spring.

Another benefit of the Internet is that the consumer is now in control. Whereas for years consumers were forced to base their purchasing decisions on limited information supplied by the manufacturer or retailer, the Internet gives them the freedom to share their experiences regarding a product or service with the rest of the world and to base their decisions on other people's experiences. As a result, manufacturers have realized the importance of providing a good service; if they don't, their ratings will plummet. The Internet has made conventional word-of-mouth advertising many times more powerful. The flip side is, of course, that commercial companies use the very same channels to try to manipulate consumers.

The Internet is the perfect place to find like-minded people, whether they are people who have purchased the same product or service you are considering, people who have the same hobby as you, people who like the same clothes as you, or people who have the same musical tastes or the same illness. These

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like-minded people organize themselves and force suppliers to take their requirements and wishes into account.

However, if we are to enjoy all of the benefits of the Internet, we must do two things. First, the gap between people with access to the Internet and those without access is widening. To avoid the global imbalance this causes, we need to strive to give everyone in the world the option to access the Internet.

Second, we need to let the Internet play a larger part in our upbringing and education. For example, we must teach people (especially children) how to deal with the almost endless amount of information that is often not verified or explained. We must teach our children how the images, videos, and information they find on the Internet relate to our cultures—that is, teach them how to determine what is fiction and what is nonfiction. What we need to teach our children today is vastly different from what we needed to learn fifty years ago.

The Internet offers so much to educators, students, parents, and researchers. The Internet not only is a nearly unlimited source of knowledge but also allows us to easily discover other

the economic crisis, traditional bankers were loathe to lend money to start-ups created a wonderful opportunity for Kickstarter, the crowd-funding platform that is now the first port-of-call for many start-ups looking for funding. Would-be companies no longer need help from a bank to realize their dream.

Another sector that's worried is retail, which is discovering that a lot

These examples show that innovation is happening more quickly now than ever before, partly thanks to the freedom that the Internet offers. This freedom is due to technology and also, to a greater extent, to creativity and social factors. The latter are turning business models upside down. Anyone in the publishing industry should be worried: the spread of broadband Internet has rendered



We need to let the Internet play a larger part in our upbringing and education. We must teach people (especially children) how to deal with the almost endless amount of information that is often not verified or explained.

cultures, to exchange ideas, and to develop solutions to common problems.

New Business Models

One remarkable consequence of the Internet is that it gives rise to new business models in which customers and suppliers can find each other directly, without the need for a middleman. After Airbnb, SnapCar, and Uber, I wonder when we'll see the first crowd-funded airplane flight? The tourist industry, the music industry, and the film industry have all suffered from the transforming power of the Internet. The banking world too has discovered how quickly things can change: the fact that, during

of people who used to buy a new bike, a new toy, or a new wardrobe are now looking to see whether a good second-hand alternative is available on classified advertising sites such as Craigslist, eBay, and thredUP or whether an expensive purchase could perhaps be shared with somebody else (Snappcar). Take MUD Jeans, for example, which introduced the concept of Lease a Jeans. When you're fed up with your jeans, someone else can wear them for a small monthly fee. And the manufacturing industry will also find things tough in the future now that 3D printing is starting to take off and change the playing field in an irreversible way.

conventional distribution on CD or paper practically obsolete—consider the success of music industry initiatives like iTunes and Spotify. Different models are being developed, and those who blindly persist in defending their existing model will be the first to go under.

Freedom under Pressure

Freedom on the Internet is not all a bed of roses. It is never absolute and is generally under quite some pressure. Perhaps the most annoying example of this relates to the fact that we're more overtly confronted with differing opinions. Whereas in our day-to-day lives we may be able to avoid opinionated views, on

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the Internet there's no getting away from them. Publish an opinion anywhere, and you're sure to get reactions from people who clearly don't hold the same views as you. That's all part of online freedom, and frankly, I believe it's good for our social fabric. Unfortunately, there are always people who go too far and react with threats, some of which are so serious that they restrict your freedom to express your opinion.

And there are other threats to Internet freedom, from both foes and "friends." Crooks restrict our freedom by stealing our identities. They send phishing emails, for example, in which they claim to be your bank or the tax office. Once they've stolen your identity, they can post things on Twitter or Facebook in your name, often with fairly unpleasant consequences. Sometimes even people you know will put photos of you or other information about

you on the Internet without asking your permission. This can be, and often is, completely innocent. Other instances amount to cyberbullying.

Freedom on the Internet is certainly not something we can take for granted. It is under constant pressure from all sides.

Invasion of Privacy

Another major threat to the Internet is the fact that commercial players encroach on our freedom. Our surfing habits, our viewing preferences, and our social media opinions are monitored by all kinds of companies that use the information for their own commercial gain. And I'm not talking just about Google and Facebook. Less-visible companies often know far more about our daily lives than we realize. They too know about us as a result of combining different (big) data sources such as our

purchasing behavior as indicated by our loyalty cards, our online habits tracked using cookies (which we blindly accept), our Tweets and other social media messages (which are analyzed using text analytics), our parking habits if we pay using our mobile phone, and our travel habits as read from public-transport smartcards and sometimes even our mobile phones, which can be monitored using Wi-Fi tracking.

Individually, this data is of some significance, but few of us regard it as an invasion of our privacy. When taken together, these diverse data sources provide a fairly accurate picture of an individual's lifestyle. The question is whether consumers want to exchange this information about themselves in return for the small percentage discount they can get as a loyal customer if they respond to offers.

In 2012, the Girls Around Me app caused an outcry. This app combined



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publicly available data from Foursquare, Facebook, Twitter, and other apps into a database of girls in an area. It let users see which girls were in a bar or nightclub, whether they were single, what their hobbies and interests were, and so on. That way, users would have a far greater chance of success in starting a conversation.⁴ The invasion of privacy and stalker connotations associated with this app should extend to any other app that combines databases, because even if the original aim is commendable, abuse can rarely be avoided, and use of these apps quickly degenerates into something far less elevated.

Government Surveillance

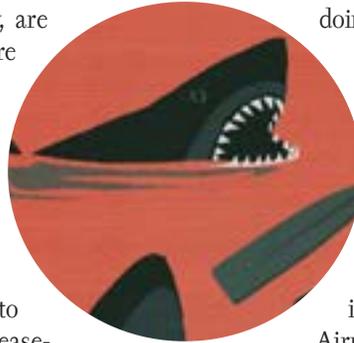
While companies are monitoring us as consumers, governments are keeping an eye on us as citizens. Some governments (such as Singapore and China)

decide what we can and cannot see; they generally claim the right to track the movements of freedom-fighters, journalists, and even ordinary citizens via the Internet. They conduct tracking not simply if they suspect that citizens are acting fraudulently, are planning an attack, or are doing something else suspicious. As a general measure, these governments follow Twitter and Facebook accounts to prevent terrorism, and they monitor parking habits to track down fraudulent lease-car drivers.

But Western governments know a thing or two about this also, as was revealed by the whistle-blower Edward Snowden. Many democratic governments

are endeavoring to undertake mass surveillance under the guise of security. Because who doesn't want to help fight terrorism and child pornography? So the surfing habits of all of us are being monitored to catch the handful of people who are doing something wrong.

The measures taken are often totally disproportionate to the number of offenders and the seriousness of the offenses. For example, should all three million Dutch passengers traveling through Amsterdam Airport Schiphol have to be registered in order to track down some 100 individuals who plan to join the Jihadists in Syria? Is it justifiable to collect the data of all UK Internet users to catch criminals? The question is, does the












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Snowden Aftershocks

The Japanese telecommunications company NTT Communications conducted a survey to investigate the impact of the online surveillance carried out by the U.S. National Security Agency (NSA) and leaked by Edward Snowden in June 2013. The survey of 1,000 ICT (information and communications technology) decision-makers in France, Germany, Hong Kong, the United Kingdom, and the United States revealed the following:

- 88 percent have changed the way they use the cloud; 38 percent have even changed the terms of existing contracts.
- 5 percent think it doesn't matter where their data is stored, which means that 95 percent *do* want to know where their data is located and also want to have control over it.
- 97 percent of EU respondents and 92 percent of U.S. respondents prefer a cloud service that uses data centers on their own continent.
- 31 percent are moving their data out of locations they no longer trust to locations where they know their data is safe.
- 62 percent of those who currently don't use the cloud are now more hesitant about using it.

Source: NTT Communications, "NSA After-shocks: How Snowden Has Changed ICT Decision-makers' Approach to the Cloud" (2014).

end justify the means? In the latter case, the United Nations found that the justification was disproportionate.⁵ I wonder where all this overkill in monitoring is heading, especially since there is still no proof whatsoever that these measures help to prevent or solve crimes and terrorist attacks.⁶

According to Snowden's revelations, the U.S. government is also embarking on a deliberate weakening of commercial technologies by trying, for example, to ban encryption and by building "backdoors" into systems. This will lead irrevocably to a less secure Internet. And clearly, these built-in weaknesses won't be exploited only by well-meaning governments. As security expert Bruce Schneier stated in his blog: "You can't build a backdoor that only the good guys can walk through."⁷

These examples demonstrate that a government view of privacy and freedom is sometimes totally different from the views of citizens. The fundamental question is, can democracy exist in a country where the government doesn't trust its own citizens—in a country where, as a citizen, you're guilty unless

proved otherwise? Recent revelations indicate that many governments are currently linking databases in order to create a profile of each and every citizen.⁸ A degree of profiling that just a few years ago was reserved for those suspected of serious offences is now being applied to all citizens. Anyone who displays a slight divergence in behavior (say, using more water than average) is immediately under suspicion. Of course, politicians hasten to assure us all that we have nothing to fear if we have nothing to hide.

The problem is, of course, that freedom is exactly that: the right to have secrets. Dutch Loesje, an international poster organization that spreads ideas in order to stimulate creativity and initiative, quips: "I've nothing to hide, but nobody needs to know that." Everybody has secrets! Obviously the government or Google can collect data about us for a delimited purpose. But when the linking of databases gives an insight into our lives and restricts our privacy and freedom, it is disproportionate to any benefits gained. And what if a totally different government comes into power? A government that's

more dictatorial? In that case, we may well have far more to hide, and we certainly won't be happy about the orderly linking of our files. For example, the Nazi government in World War II was very grateful for the well-ordered records that many European governments had kept, especially for Jewish citizens.

What is needed, and what so far has been lacking, is an in-depth public and political debate around proportionality. Which freedoms and which privacies do we want to retain, and which are we willing to sacrifice for a little more security? Most governments don't want to accept that there's a price to pay for an open democratic society. Terrorism cannot be dispelled. The same politicians who claim they support freedom of expression can be found the next day proposing to ban encryption, reduce the usage of social media, and link databases. Limiting our acquired liberties would mean a victory for Al-Qaeda and ISIS.

The price to pay for an open democratic society is that sometimes, things happen that should never have happened—things that go beyond anything we could possibly have imagined—and lives are lost. Every year, thousands of people die in accidents on motorways. But we don't close all the motorways. The same factors we take into account when assessing the proportionality of measures to prevent these deaths should be applied to tracking and preventing crime and terrorism.

Dependence

Another disadvantage of the Internet is that we've become heavily dependent on it. We don't know what to do when we can't pay online with PayPal or when we can't use our smartcards or when our Internet service goes down. Services have gone digital very quickly, often to such an extent that there is no longer an analog alternative. But who can guarantee that the Internet will always be available? As we've already seen, the Internet is a network of autonomous networks—there is no owner who is responsible for the availability and reliability of the Internet as a whole. And the bad guys know this.

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Experience tells us that it's easier to attack than to defend. This is also the main conclusion of the World Economic Forum's Global Risks 2014 report, which states: "The world may be only one disruptive technology away from attackers gaining a runaway advantage, meaning the Internet would cease to be a trusted medium for communication or commerce."⁹ Attackers are indeed inventive and are constantly coming up with new methods. The defense can only react, and that means, effectively, that we're always one step behind. One thing is certain, however: the days when a password was sufficient to protect a digital identity are long gone.

As the Internet moves into a future where more devices and sensors are connected (i.e., the Internet of Things), we will become even more dependent on the Internet. The monitoring of our health, our comfort, and our safety (e.g., flood control) is becoming highly dependent on all kinds of sensors, and these sensors are connected to diagnostic systems and sometimes even to controlling systems. People will increasingly use "wearable technologies" that disclose ever more data about them to the Internet (i.e., the "quantified self" movement). Collecting data is often done for a good reason, but clearly, doing so makes us even more dependent on the technology and more open to abuse.

The Future of the Internet

When considering Internet freedom, we need to keep governance in mind. As noted earlier, the Internet may not be a total anarchy, but it does have anarchic tendencies. And these tendencies mean that there are no, or at least very few, centralized rules that everyone must follow. In offline society, on the other hand, it is clear who makes the rules, and it is also clear when the rules are broken and how these infractions will be dealt with. Rules can increase citizens' freedom because everybody is clear on what they can and

cannot do. It is this clarity that is sometimes lacking on the Internet.

I don't think we should, or indeed could, put the responsibility for "regulation" of the Internet entirely in the hands of governments. There must be a multi-stakeholder decision process based on discussions in which citizens, consumers, interest groups, and commercial players are all involved. And it must be an international discussion. The rules will be different in every country because nondemocratic countries will never fully agree with what democratic countries understand as freedom. But that doesn't mean we shouldn't all be involved in the discussion.

Major challenges lie ahead: cybercrime, cyberterrorism, online child pornography, and even digital warfare. These problems exist in offline society as well, but for most people, the challenges have come closer to home through the Internet. These problems can't be solved in isolation. The only way to tackle them is by working together—on all fronts and with all stakeholders involved.

If we don't succeed, we risk a "Balkanization" of the Internet, a division into different regions, each with its own access policy and other rules. Then, it would no longer be citizens who decide with whom or what they communicate; it would be the local government. Permissionless innovation would no longer exist. Unfortunately, this frightening scenario is not completely far-fetched. China has already partly achieved this, and Russia has threatened on several occasions to isolate the Russian Internet from the perfidious influences of the West.

Luckily, most democratic governments still believe that the Internet should be open, secure, and accessible to all. In recent Internet governance discussions, both the United States and the European Union have endorsed the multi-stakeholder model. At the same time, governments and politicians are often way off the mark when it comes to the impact of the Internet of Things,

database linking, social media, and cybersecurity. At times this lack of understanding is amusing, but at others it can be dangerous.

This is why all countries in the world need to have an in-depth public and political debate on the development of the Internet, our dependence on technology, and privacy and freedom. Ideally, these debates could help shape a vision that future governments could use to develop suitable policies, legislation, and enforcement as part of a truly multi-stakeholder governance model for the Internet. After all, the Internet is no longer something that belongs only to the online world. It is a wholly integral part of our society. ■

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Innovative Cooperation, at Scale: **AN INTERVIEW WITH MICHAEL M. CROW**



MICHAEL M. CROW became the 16th president of Arizona State University on July 1, 2002, leading an institution that combines academic excellence, inclusiveness to a broad demographic, and maximum societal impact—a model he terms the “New American University.” Under his direction, the university pursues teaching, research, and creative excellence focused on the major challenges of our time, as well as those central to the quality of life, sustainable development, and economic competitiveness of Arizona and the nation. He has committed the university to sustainability, social embeddedness, and global engagement and has championed initiatives leading to record levels of diversity in the student body. He is co-author of the book *Designing the New American University* (2015)

Earlier this year, EDUCAUSE President John O’Brien sat down with Crow for a wide-ranging conversation covering numerous topics including student success, technology changes in recent years, institutional transformation at scale, cooperation within higher education, personalized learning, and analytics.



John O'Brien: I was thinking this morning about your “No More Excuses” *EDUCAUSE Review* interview from four years ago,¹ in which you explained that the use of analytics at ASU was being driven by the objective of student success—not only student success institutionally but student success nationally. You talked about how all of us in higher education should “focus on our own performance and the need to enhance student success. There are no more excuses.” For a lot of us, this was a watershed moment in thinking about student success. Would the excuses be different today, in 2016? Would the solutions be different?

Michael M. Crow: The big thing that would be different in 2016 is all of this hesitancy about the integrated, aggregated tools—both software and hardware—that we now have available to us. These tools have moved so far forward that they are now unbelievably powerful in changing student outcomes. They can extend. They can expand. They can enhance. They can individualize. They can do all these things that even a few years ago they couldn't do. You hear people saying: “It's too hard. It's too expensive. We can't do that.” The fact is that they don't *want* to do that—it's all excuses. We need to get about the business of integrating technology-based learning platforms as enhancements of our faculty and enhancements of our instructional environment.

O'Brien: In 2012, did you foresee some of the current environment of technology opportunities in these systems?

Crow: I don't know that I foresaw the details, but certainly the trend. The trend is the Internet of Things, with everyone wearing a supercomputer on or near their body. That supercomputer—which is then enhanced by other devices, other tools, and other mechanisms—can deliver knowledge and insight. This empowering platform can take individual faculty members or individual departments and “amp them up” in terms of outcome.

O'Brien: Are there technologies that you think might change the game again in five years?

Crow: There is an integrated set of technologies that I think could enhance learning through what we're calling education through exploration. These are game-based learning platforms that can be used for base or core types of programs. The ASU Center for Education Through eXploration (ETX) is developing a series of ways of teaching science through exploration, for example by exploring for habitable planets (Hab-Worlds). All the data, all the planets, all the science is real. Students learn the tools of science, the means of science, and the questions of science through the act of exploration. By the time students are done, they have mastered what they need to know at the freshmen college level for biology, chemistry, or physics.

O'Brien: In your earlier “Solve for X” presentations, you talked about universities as being *moonshot factories*, a place where moonshot ideas and learning platforms can be constructed. But you also talked about “blowing up” sixty-eight academic disciplines at ASU, which may be a menacing idea to some in higher education.

Crow: The United States has always been a country of big ideas and unbelievable aspirations. Universities have been an empowering mechanism. They've produced the people. They've produced many of the ideas. But as we encounter complexities and issues in our social systems, our technological systems, and our environmental interface, we need to ensure that the moonshots, the big solutions, can still come out of the ideas generated by the teaching, learning, and discovery environment of universities. To get there, you have to be willing to be disruptive and to be non-replicative. Why do all public colleges and universities build the same structure? Why do they all have the same political science department, the same history department, the same chemistry department?

Why aren't the departments at different institutions wildly different? We should be offering students various pathways for learning while retaining the grounding knowledge. Moonshots are possible through highly differentiated logics and highly differentiated thinking—not through replicative bureaucracies that all follow the same pattern and structure and implement the same plans and strategies. That's not what we need.

O'Brien: You talk a lot about scale. Many people hear the word scale and think one-size-fits-all and a lack of differentiation. But you're saying that scale means the opposite.

Crow: I talk about scale as intellectual scale. It is breadth and differentiation. In aggregate, public colleges and universities (in particular) should have a breadth and a depth that we don't presently have. We should be covering not only the waterfront, but the waterfront and then some: our intellectual positionings, our levels and types of engagements, our problems being tackled. We could then have a higher probability of producing broader learners, master learners, as

“Moonshots are possible through highly differentiated logics and highly differentiated thinking—not through replicative bureaucracies.”

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well as a higher probability of solving some of these very, very intractable problems. We do that not by replication but by a scaling of ideas, a broadening of the scope of the overall public higher education enterprise.

O'Brien: Is there anything unique to public higher education institutions that either limits them or creates challenges when they try to scale up?

Crow: Public colleges and universities are dedicated to what I call the public value outcome. That is, they have to respond to the needs of the people. They can't scale to the size that they want to be, acquire the resources to do that, and then say they're done. That's what a private college or university is able to do. The public college or university has to find a way to right-size what it is doing to fit the community that it serves. But at the same time, public institutions must be responsive to market demands and market forces. That's the unique intersection that public colleges and universities must navigate.

O'Brien: You are the president of a public research institution with 80,000-plus students. What about a private college serving 1,000 students or a community college serving 20,000? Will what works for your institution work for them?

Crow: I think it's all the same. ASU is an aggregation of tiny programs, small colleges, and medium-sized colleges. We have schools with 500 students. We have colleges with 25,000 students. The issues and the dynamics are all the same: the desire to individualize, the need to innovate, the demand to introduce technology. What goes on in our School of Music is different from what goes on in our School of Sustainability, which is different from what goes on in our school of Human Evolution and Social Change, which is different from what goes on in our College of Public Service and Community Solutions. All of those deans, directors, and faculties have to build

unique pathways within their units. It's no different.

O'Brien: I suspect some people have an image of you and ASU moving from one success to the next. What about the times when your plans didn't go well or when you faltered?

Crow: Every day is humbling. We've done things where the experiment didn't

work. We've done things where the educational outcomes suffered because of what we tried. We've had many defeats. But we continue to launch many change trajectories. The hope is not that all of them will work but, rather most of them will work. We're not shooting for a perfect outcome, because that's not attainable. We're shooting for measurable difference. We've nearly doubled our four-year graduation rate. We admit A students and B students, roughly 50-50 for incoming freshmen. We're trying to raise the incoming performance of all these students, regardless of their high school outcomes and performance, but this has been an unbelievably challenging process for us. In terms of our performance, we're compared with schools that admit only A students. Some public institutions admit only A+ students or students with a 3.9+ weighted GPA. We decided not to go down that path, because we think this is above the level necessary for college success. But trying to make this work, across the breadth of our students' incoming academic ability, has been difficult. Some lessons have been painful, some successful.

"We're not shooting for a perfect outcome, because that's not attainable. We're shooting for measurable difference."



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O'Brien: What about personalized learning?

Crow: I'm a big believer in the work of Howard Gardner, a Harvard psychologist, about different types of intelligence. I can see it in my children. I can see it in my siblings. I can see it in everybody. We learn differently. We think differently. We have different types of intelligence: analytical intelligence, emotional intelligence, tactile intelligence, spatial intelligence, verbal intelligence—the list goes on. There are certain things everyone should know, but how those things are learned needs to be personalized and individualized around the way someone learns. We've found that through adaptive learning platforms, we can change math outcomes, physics outcomes, chemistry outcomes, economic outcomes. We have become very focused now on trying to create as many opportunities as possible for the individualization of learning. People resist this unbelievably powerful, personalized, individualized learning base that allows us to learn in the way that we need to learn, and I don't understand why. We need to get to the point where students are working on three majors and studying two languages in addition to undertaking real projects and having a job. That can't happen without a tremendous enhancement of the learning environment.

O'Brien: This “tremendous enhancement” involves change. These days the news media and the public discourse are already very concerned about the drastic changes in higher education.

Crow: The public dialogue is, I think, largely reflective of the anxiety surrounding the rate of change and the direction of change. We've come to realize that what we thought of, for decades, as the need to push higher educational outcomes has now become more than an aspiration of families to enhance social mobility. It has become an imperative, a necessity for economic adaptation. The

world is continuing to evolve into a more complex economy, one increasingly driven by knowledge and technology and morally driven by new gateways to the middle class on a global scale. These new, global middle-class workers are replacing U.S. middle-class workers. The latter, highly productive, had been able

to raise a family and build a community. All of that is now gone.

The current social disruption is as significant as the social disruption experienced when we moved from the agrarian revolution to the industrial revolution. We're now in this no-man's-land, where change is occurring rapidly.

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“We have become very focused now on trying to create as many opportunities as possible for the individualization of learning.”

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For evidence, data from the Bureau of Labor Statistics shows that employment of people with less than a high school diploma has fallen 15 percent since 2006, while employment of bachelor's degree holders has increased 22 percent. People need to ask themselves: What do I do? How do I adapt? Am I able to change? A person's ability to adapt is strongly linked to his/her educational platform.

Meanwhile, colleges and universities have been particularly poor at responding to this angst. They've seemed arrogant and/or isolated and cut off. Public institutions have not found a way to tell people: “We've got your back. We're going to work to move your families forward, and not just with the traditional things that we've already done. We're going to continue to morph, adapt, and change. We're going to move in new directions.” I believe that some (though not all) of the negative energy that we're getting from the legislatures around the country is justified. Our value proposition has not been enhanced, and we need to do so. But there is another, critical issue: How do we afford all of this? How do we pay for it?

O'Brien: How *do* we afford all of this? Has the financial anxiety around higher education created a helpful sense of urgency?

Crow: If you are an institution in an innovation mode, all adjustments to the environment help. If you are a conservator of bureaucracy, as most academic institutions are, you just hunker down and wait for the external threat to go away, hoping that things will return to the normal curve. Except that there's no longer a normal curve. There's no more normal. In the past we were willing to pay to take 5 percent, or even 20 percent, of the population to a college degree. I don't know how we pay for that. We have to defeat the idea that somehow face-to-face service organizations or creative organizations can't lower their costs. We must lower costs. We must find ways to do things in new ways, or we're not going to be at the level of service that we need to be.

O'Brien: I'm curious about the faculty reaction to everything you've accomplished. What do faculty members say

when they're talking about all of this?

Crow: Probably the most important thing we've done at ASU is move away from a faculty-centric culture to a student-centric culture. At the core of the institution are the students, our learners; we are attempting to create an environment that will be of the greatest assistance to them. It might sound a little simplistic, but we shifted toward the idea that the university doesn't exist for the faculty; it exists for the students and the community. Once people began to sign up and enroll around that idea, we were able to empower faculty to be designers of their own fate. They were no longer basically operatives in a bureaucratic structure that they inherited and in which they had no say over its ultimate structure or design. We said: “You design what we are. You configure how you'd like to be structured or organized. You make all that work.” That has gotten us to the point that we have approximately 85 percent of the staff and faculty supporting where we've come from, what we're doing, and where we're headed.

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O'Brien: Let's talk about faculty who resist changes.

Crow: ASU was founded in 1885 as a teacher's college: Tempe Normal School. The name was changed to Arizona State College in 1945 and to Arizona State University in 1958. The process of becoming a research university followed, intensifying in the 1980s. By the time I arrived at ASU in 2002, we still had legacy units from all the way back in our teacher's college days. We had other units that were attempting to become research units. Many were at odds with one another. So we went to three biology departments that were legacy units, having been built over the decades. We said: "These departments are not achieving the level of excellence that is required for our students. You've got a semester to come up with a better design. Clean the slate, and design whatever you want." About 115 or so faculty were a part of this process, and they designed a brilliant idea for an integrated school of life sciences that would include philosophers, policy analysts, scientists, and ethicists all together in one school. There were no departments. Faculties could change at will. Individual faculty could move into new areas through self-designation. It was a fantastic idea, and 95 percent of the faculty agreed to the design.

Now, typically at a university, when 5 percent of faculty are opposed, the matter fails at that point. One, two, or three people could stop any change. We didn't let it fail. We went ahead and did the design. That was the moment when people thought: "Oh, I think we can get things done here." All the faculty who had been disempowered by the individuals who could veto anything now realized that good ideas, with a majority of support, could move forward. They understood that we would make hard decisions, that we would put resources behind those hard decisions, and that we would enable faculty to be the architects of their own future. That was in 2004.

O'Brien: How do you maintain that empowerment?

Crow: You have to change things up. We did away with regular semesters. We went to six academic modules, in three terms, for the year. We're allowing faculty to teach courses that are seven and a half weeks long if that's what they want to do. They can teach technology-mediated courses, or not. We're allowing departments and schools to decide on their own. Do they want to offer online courses? Do they not want to offer online courses? We create a set of objectives and a set of design aspirations. Then we allow the genius of the faculty, the collective insight of the faculty, and the wisdom of the faculty—in each of their subparts of the university—to figure it all out. For the most part, they have gone beyond any expectation that I could ever have imagined. They are unbelievably smart, unbelievably capable, unbelievably adaptive, and most important, unbelievably committed to our students.

In addition, we set as a design aspiration the acknowledgment that we're not going to be successful unless our students are representative of the entire social and economic diversity of our society. Thirty-five percent of our undergraduate students, close to 26,000, come from families that are Pell-eligible. We have students that reflect the entire breadth of our society. Most of our faculty are excited to be a part of an institution that has this aspiration as a mission.

Empowerment goes to the question of why we are here—to the university charter. Our charter states (1) that we won't measure our success by who we exclude but, rather, by who we include and how they succeed; (2) that we'll do research measured for the public benefit, not only for our academic benefit; and (3) that we will take responsibility from the outcome of our community—the social outcome, the cultural outcome, the health and well-being outcome. We've made these goals specific, and we've given the

power to the faculty to figure out how to reach them. We thus have found ways to empower faculty as designers, as social forces, and as people who are making a tremendous difference.

O'Brien: You mentioned departments that weren't performing well. Did they know they weren't performing well, or did you use analytics to help them understand something that perhaps they hadn't realized?

Crow: We used analytics, data, and analytical tools. Analytics is essential to the process of change. If you don't know where you are in time or space, you don't know how you're performing as opposed to how you might perform or how you should perform. You don't know anything. At that point, you're just managing the post office: yes, we're open; no, we're closed; this is when the mail is delivered; this is when the mail is not delivered. We really need to move universities away from the post office style of management. We're not the post office.

O'Brien: Is there a next wave of analytics for ASU?

"Analytics is essential to the process of change. If you don't know where you are in time or space, you don't know how you're performing."

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Crow: What we realize is that the biggest things that we've ever conceptualized, the biggest ideas that we've ever come up with, the biggest changes that we've ever been able to even think about—they're all in the works now. Our rate of change, our use of analytics, our use of big data, our use of tools, our use of design as a modality is accelerating within the institution. Now we're able to think about things and do things that just five years ago none of us could even imagine. I do a lot of mountain climbing. When you climb in the mountains and you get to one summit during your climb, you realize: "I'm not even at the top." There are higher summits all around. We realize now that we're nowhere even near where we can get. We can see where we can get, but we're not near it.

O'Brien: What have you learned that you would pass on as advice to deans, provosts, CIOs, CEOs, presidents, and others working toward change?

Crow: Break out of the bureaucratic model. We've been in the mode of a railroad, on a metal track with a preset course. Get off the track, remove the metal wheels, put on the big rubber wheels, and head out over land. Do not follow others. We need unique manifestations of colleges and universities that are connected to their place and that are adaptive to the needs of their regions. I am not saying to throw out the base knowledge in language or literature or history or culture or anything like that. There's simply not enough design work going on.

O'Brien: Can this be accomplished individually by higher education institutions?

Crow: We've long had a struggle in the United States, since the time of the country's founding fathers, to build a connected set of public colleges and universities. The U.S. higher education institutions became highly competitive with one another. Although competition can be positive, I think we need

"When you climb in the mountains and you get to one summit during your climb, you realize . . . there are higher summits all around."



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more cooperation and more innovation among and between universities. One step toward this is the University Innovation Alliance, consisting of eleven large public research universities (including ASU)—400,000+ students. We have all agreed to produce more graduates (in particular from lower-income families), to innovate together, and to lower our costs. In higher education today, most colleges and universities operate as if they're not even in the same game. We need individual uniqueness for each institution, along with cooperation

among and between the schools to leverage each other in every possible way.

O'Brien: What is the role of EDUCAUSE and other associations?

Crow: I think associations like EDUCAUSE should focus on facilitating innovative cooperation—which you do. Associations can encourage team engagement and set analytically based goals and objectives for institutions to work toward. In addition, networks are unbelievably important. Associations can help create an actual living, breathing, interactive network of institutional representatives. We're getting a little sense of this in the University Innovation Alliance, in which the financial aid officers work together and all the admissions officers work together, learning from each other, adapting to each other, and taking the shields down just a little bit. Associations can articulate our collective thinking, our collective wisdom, and help to establish and build these learning networks.

O'Brien: Are you ever accused of being too utopian?

Crow: I'm hopeful that we all have a utopian element in the way that we think about the future. That's called aspiration. No ideal is attainable, because human beings are imperfect. Utopia is unattainable because we are imperfect. But we can dream of a world in which any child from any family can go to a college or university and be successful regardless of family circumstance or family income, and we can dream of a world in which any person can be empowered to become a master learner and a master adapter. If we set that as our aspiration and work toward it, we will achieve a better set of outcomes for everyone. ■

Note

1. "No More Excuses": Michael M. Crow on Analytics," *EDUCAUSE Review* 47, no. 4 (July/August 2012).

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William H. Graves

—For lifetime achievement in the field of higher education; for pioneering technology-enabled strategies to improve institutional and academic performance; for playing a key role in launching and developing many of the foundational organizations that continue to benefit the higher education community

education, Bill directed his team at UNC to the forefront in leading the higher education sector into the ubiquitous adoption of learning management system software.

While on leave from the university in 1997, he founded and directed the nonprofit Collegis Research Institute and, after retiring in 1999 from UNC, founded and chaired the board of Eduprise. In these positions and later at SunGard Higher Education and Ellucian (a series of evolving corporate entities linked through acquisition), Bill successfully bridged his faculty/administrative role with executive positions in major technology corporations and helped to pioneer technology-enabled strategies for measurably improving on and accounting for institutional and academic performance in postsecondary education. At the time of his retirement in 2014, Bill was senior vice president for academic strategy at Ellucian.

Bill was a prolific writer and speaker on the connections between learners and technology, on the potential of technology to help meet institutional and societal goals, on the importance of evolving models and partnerships among educational stakeholders, and on the issues of access, retention, affordability, and educational justice. He explored these themes in more than eighty published articles and books (he was a generous contributor to *EDUCAUSE Review*) and in his blog, *The Learning Cloud*.

Throughout his career, Bill was a driving force in creating several organizations that continue to influence the higher education community. Bill served on the boards for CAUSE, EDUCAUSE, and the Coalition for Networked Information (CNI). He played a key leadership role in launching Internet2, the IMS Global Learning Consortium, and Educom's National Learning Infrastructure Initiative (later to become the EDUCAUSE Learning Initiative).

2016

Leadership Award

EDUCAUSE posthumously bestows a 2016 Leadership Award on William H. (Bill) Graves, who has left an indelible mark on the higher education community in his career of more than forty years. Bill passed away in April 2016 after a courageous battle with brain cancer.

For thirty years, Bill served the University of North Carolina at Chapel Hill (UNC): as a math professor, dean for general education, interim vice chancellor for academic affairs, senior IT officer, and founder/director of the Institute for Academic Technology. The IAT, a partnership between the university and IBM, led to the development of groundbreaking software for supporting courses using the Internet. Always ahead of his time in understanding the potential of technology to transform

Additionally, Bill served on governing or advisory organizations for Antioch University, UNC-Chapel Hill School of Information and Library Science, the National Center for Academic Transformation, the U.S. Department of Education's Fund for the Improvement of Postsecondary Education, and the International Association of University Presidents.

Bill's foresight and leadership shaped the world of higher education, and the products and services he invented or helped develop have had a lasting impact on teaching, learning, and communicating. Overall, his pioneering spirit and his dedication to the greater good—and his ability to combine the two—were what made Bill an outstanding leader for EDUCAUSE and the higher education IT community.



“I seriously doubt there is anyone in the field of technology and higher education who does not owe a direct debt of gratitude to Bill. His extensive writings and presentations cut a wide swath, from highly technical papers to connecting H. G. Wells's view of education as running a race for educational justice and attainment. Overall, Bill's work addressed interfaces:

- *The interface between the learner and technology.* Throughout his career, Bill focused a great deal on how the learner's experience can be enhanced with the proper access to and use of technology. He did not view technology as an end in itself but as a tool that is useful to learning. This view also underlies the software he co-developed.
- *The interface between learning technology and policy.* Bill was one of the few people who could articulate the need to provide the infrastructure for enhancing learning and the strategic policy directions that postsecondary institutions must take to maximize both their investment and the learning outcomes. The ease with which he navigated between the academic and the corporate worlds made a very difficult translational conversation happen in ways and settings that would be nearly impossible otherwise, permitting the interweaving of strategic directions in each.
- *The interface between technology and global access to education.* One of Bill's deeply personal values was the need for equal access for all to quality education. Bill saw technology as a way to achieve that. His writings over the past several decades presaged the current discussions and debates regarding access to, retention in, and completion of postsecondary education by individuals who come from financially challenging backgrounds. He argued passionately that governments and institutions must create new, different forms of collaborations with public and private organizations to deliver content in ways that facilitate learning.

I never encountered a person who was more generous with his time or more patient with someone who was far less knowledgeable than he. Bill was a superb mentor, willing to spend as much time as needed, at any time, in any place that made learning and thinking easier. He always devoted far more time and energy to his work and mentoring than anyone ever expected of him. His humility meant that he did not seek or take credit for his own impact. That's so refreshing in this age of Instagram and Twitter. I know my career has been much richer and fulfilling because of his mentorship over more than 20 years.”

—John C. Cavanaugh
President and CEO, Consortium of Universities
of the Washington Metropolitan Area

“Bill's leadership in online learning has profoundly influenced the field over the past 25+ years. His ability to bridge the gulf between the quality academic outcomes we all seek and the underlying technology, while applying sound business principles, was his trademark. His conviction that online learning would reach its potential only by being based on realistic financial goals and sound management has been borne out time and again by the successes and failures of the field. And Bill's ability to speak to all the diverse contributors to online program success, in their own terms and frames of reference, was unique.”

—Ron Legon
former Executive Director,
Quality Matters, and former Provost,
University of Baltimore

“Bill’s work could potentially be summarized along three key concepts. The first is the importance of understanding and effectively implementing the role of higher education leadership in reaching national and global goals for knowledge development and credentialing. One of the reasons Bill was such a sought-after speaker and adviser was his ability to connect institutional mission objectives with larger societal goals, resulting in great respect from a wide variety of university and college presidents and chancellors.

The second key concept is the importance of the potential role of technology in improving the ability to meet national, global, and institutional goals. Bill was never an advocate of technology for its own sake. Instead, he focused on the ability of technology to enable high-touch interaction and services to improve the educational experience and graduation rates. In both academic and industry settings, he helped institutions realize excellent return on their investments in technology.

The third key concept is the importance of partnerships. To meet the societal goals for education, the academy must be willing to consider and adopt more efficient and effective models. Bill was constantly seeking new forms of partnerships among a diverse ecosystem of public and private educational stakeholders to consider how to evolve practice on a broad scale.

Finally, Bill’s devotion to leadership was accomplished in a tireless and selfless manner. Among those he worked with, Bill was known as being totally dedicated to the cause. His devotion to these ideas was 24 hours a day, 7 days a week. Furthermore, he was noteworthy in that his interest in self-promotion or even career advancement appeared to be minimal. Bill was genuinely interested in advancing these causes in a selfless manner.”

—Rob Abel
CEO, IMS Global Learning Consortium

“Bill was truly a pioneer, a renaissance man interested in everything. He was ahead of his time in understanding and communicating about how technology transformed education. Bill was a gentle, but persistent colleague who facilitated a collaborative environment like no one else—where people really listened and learned from one another. He inspired so many, and his insights about how institutions could enable technology to further their missions made him a true innovator. His contributions to our industry, and his zest for life and learning, will be forever remembered.”

—Dave Lambert
President and CEO, Internet2

“Bill was one of the early adopters of technology. Originally a mathematics professor at the University of North Carolina-Chapel Hill, he became known across the country as a spokesperson for the transformative power of information technology. Starting in the 1990s, Bill spoke at hundreds of campuses creating awareness and enthusiasm for information technology. Of course, Bill continued in the profession, with many more accomplishments and positions. But no matter what his role, Bill continued to advocate for the many ways technology can enhance higher education. He never ceased writing and thinking about technology innovations. On a personal note I will be forever grateful to Bill for helping me develop an understanding of information technology and for modeling how to be an effective advocate of its power.”

—Diana Oblinger
President Emeritus, EDUCAUSE

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3/13–3/14 | Portland, OR

Management Boot Camp
3/13–3/14 | Portland, OR

NERCOMP Annual Conference
3/27–3/29 | Providence, RI

APRIL

EDUCAUSE Connect
4/10–4/11 | Chicago, IL

New IT Managers Program
4/10–4/11 | Chicago, IL

Management Boot Camp
4/10–4/11 | Chicago, IL

MAY

Security Professionals Conference
5/1–5/3 | Denver, CO

JUNE

Leading Change Institute
6/11–6/17 | Washington, DC

JULY

Leadership Institute
7/10–7/14 | Long Beach, CA

Management Institute
7/24–7/28 | Long Beach, CA

Learning Technology Leadership Institute
7/24–7/28 | Long Beach, CA

OCTOBER

EDUCAUSE Annual Conference
10/31–11/3 | Philadelphia, PA



Donald Z. Spicer

—For extraordinary leadership, effectiveness, and statesmanship; for visionary promotion of information technology at institutional, system-wide, and organizational levels; for fostering collaborative efforts to develop a thriving environment of IT services and support; for research that advanced the thinking around strategic issues in higher education

2016 Leadership Award

EDUCAUSE recognizes Donald Z. Spicer, associate vice chancellor for information technology and CIO for the University System of Maryland (USM), for his dedication throughout his career to shaping and developing model initiatives that work across institutional categories and boundaries in support of the educational mission.

At USM, Don has been responsible for developing a shared IT vision for a system that is a representative cross-section of U.S. public higher education. The system includes twelve institutions with diverse missions. In addition to his IT role, he has led a number of system initiatives promoting academic transformation, advancing an understanding of the impact of disruption, and improving effectiveness and efficiency.

A common thread running throughout Don's career is his ability to bring people together in a spirit of vision, trust, and collegiality to achieve successful multi-institutional collaborations. During his eighteen-year career at USM, Don has mobilized efforts for several major initiatives, including the creation of the Maryland Education Enterprise Consortium (MEEC), which establishes contracts for hardware, software, and services for the state's entire K-20 community: public, private, and federal. He also helped establish the Maryland Research and Education Network (MDREN) and Collaborative Solutions Maryland (CSM), both of which support the collective network-related needs of K-20 education across the state. Don also led the effort for system-wide membership for USM in Internet2. In recent years, he has worked to support the collaborative activities of USMAI (University System of Maryland and Affiliated Institutions), the state's four-year library consortium of academic institutions.

Don began his career as a faculty member in mathematics. At Vassar College, where he transitioned into an academic administrative position, he worked closely with Educom, jointly receiving a FIPSE (Fund for the Improvement of Postsecondary Education) grant that allowed the college to expand its academic computing technologies and become a model for the use of technology at liberal arts colleges. Later, at the University of Notre Dame, he led efforts to support the innovative use of technology in teaching and learning and was instrumental in broadly redefining the role of technology at the university.

Don has always been active professionally in major national technology initiatives. While at Vanderbilt University, he was part of the CIO group that formed Internet2 and also lent support to the creation of Southern Crossroads (SoX), the regional Internet2 GigaPOP. Also at Vanderbilt, he worked closely with the Sloan Foundation to initiate online learning and helped establish the asynchronous learning network (ALN). In 1996 he joined the editorial board of the *Journal of Asynchronous Learning Networks* and served as one of the journal's associate editors from 2011 to 2015. He currently is the co-editor of a new journal, *Journal of Innovations in Online Education*.

Don's many contributions to EDUCAUSE and its predecessors date back to 1991. In addition to serving as a regional conference chair, committee member, speaker, moderator, and mentor on countless occasions, he was an ECAR (EDUCAUSE Center for Analysis and Research) Fellow from 2003 to 2013, during which time he authored publications and bulletins that advanced research on issues of significance to IT leaders and the higher education community.

Throughout his career, Don has distinguished himself as a leader with a deep understanding of the foundational importance of technology to the educational enterprise. He brings to any endeavor his skills in cultivating relationships, cooperation, and a sense of shared purpose in serving the greater good.

EDUCAUSE Review: When you think about your career, what lessons learned would you pass along to those starting out in this field? What is required for effective leadership? Have those requirements changed?

Spicer: I became a CIO as my second career in higher education. Like many of my peers, I came from the functional side, as opposed to what was then the “data-processing” side of the field. Thus, I have always considered myself to be primarily an educator rather than an IT professional. Understanding that, one has to know one's limitations and depend on a strong professional technical staff. In large organizations, a strategic, mission-related view is important for the CIO. The goal is to align with the activities of the organization, not necessarily to follow the latest technological trends.

The biggest surprise to me as I progressed in this career was that the most important skill set for the job was related to people. Within the IT organization

are many heads-down professionals very focused on the nitty-gritty, as is necessary. On the organizational side, a large number of individuals want technology to support their activities and aren't concerned with the details. The CIO has to understand—and be a bridge between—both populations.

Increasingly, within large IT organizations, CIOs lead the “softer” side while CTOs lead the technical side. Newcomers to technology leadership should assess their interests and skills and pick a path.

EDUCAUSE Review: Do you have advice for emerging leaders? Anything that you wish you had known before?

Spicer: When I entered the field, it was young and immature. Coming from the faculty was a reasonable starting point. Several decades later, higher education IT leadership is a recognized professional path. One of the things I lacked, from which an emerging leader would benefit, is a mentor. Although I formed relationships with wise colleagues, a more formal arrangement would have benefited me. In fact, one of the proudest aspects of my career is the number of higher education CIOs



“The biggest surprise to me as I progressed in this career was that the most important skill set for the job was related to people.”

who previously served on my staff; they created their careers, but I hope I played a role.

In addition, I believe that higher education *really* is different from other enterprises. IT leadership in any context involves a lot of ambiguity, but higher education tops the list in that regard. There are many stakeholders, often with conflicting agendas and power. Unlike business, where there is a clear bottom line, educational institutions have varied priorities, and sometimes metrics are unclear. Governance is an important tool, but it goes only so far. Higher education experience is therefore critical to leadership success.

Another observation is that higher education CIOs move around a lot. Neither I nor my family understood this when I made a career change. I've been extremely fortunate in the institutions with which I have been associated, but that was a matter of luck and circumstances as much as anything else. If one aspires for stability, being a CIO may not be the right professional goal.

EDUCAUSE Review: How important is it to partner strategically across the academy, and how do you advise leaders do that?

Spicer: My CIO professional career has gone from campus IT leadership to university system leadership. At the campus level, my job was to build bridges between the IT organization and the administration, between the IT organization and the academic community, and among diverse groups with common needs, such as high-performance computing where working together garners more results than working separately.

In my system role, facilitating strategic partnerships has become a major part of my job. At the University System of Maryland (USM), we have benefited greatly by thinking outside the box and reaching out to all educational segments in the state—K-12, two-year institutions, private colleges and universities, and other public institutions—to align in highly leveraged activities. In my area, these activities include procuring IT products and services, ensuring wide-area networking, sharing library resources, and promoting academic transformation. Along with colleagues in the USM Office, I also work to align public higher education with the needs of the state.

Location drives Maryland's knowledge-based economy; the state's relatively small size helps build personal relationships; and citizens' expectations make higher education—public and private—important for the state. All of this contributes to building strategic partnerships that meet common objectives, not just proprietary ones.

EDUCAUSE Review: During your career, what kept you up at night?

Spicer: While many of the technology initiatives during my career have involved significant monetary investment, the technology is the easy part of the job. There are always implementation and support issues, but if one is fortunate enough to have good technical staff, these issues are manageable. Some situations allow a fair bit of discretion, but in others, every project has to be justified. One learns to live within the system.

What has kept me up at night are the people issues. Do we have the staff resources to meet expectations? How can we balance conflicting requests from a community that simply wants appropriate, working technology to do their jobs?

EDUCAUSE Review: What do you think will be keeping IT leaders up at night in the future? What are the key issues that will be influencing the profession and higher education overall?

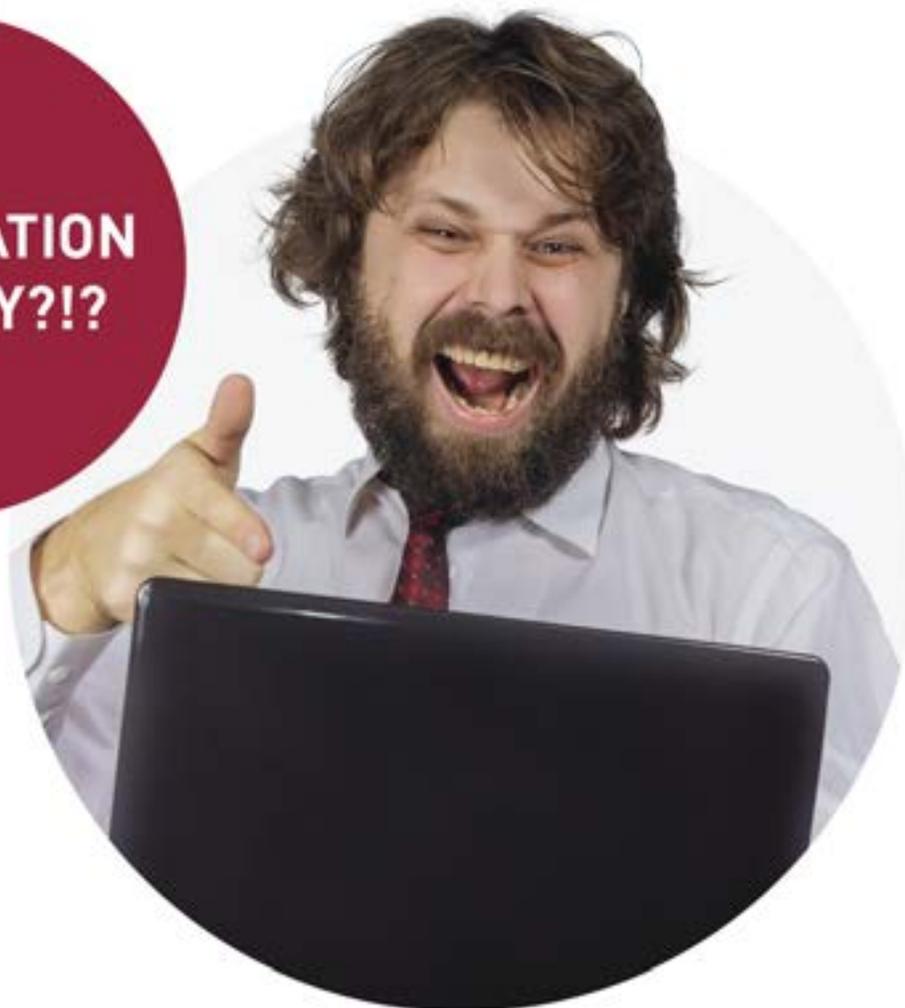
Spicer: In recent years, an ongoing debate has centered on the CIO's role as strategist and enabler of institutional change versus the CIO as tactician focusing on information technology. Higher education institutions have often taken the tactician view, but the pendulum keeps swinging. As a new generation of higher education leadership comes into place, I believe there will be more focus on the strategic role of the CIO. Higher education is undergoing much of the same disruption that other industries have experienced, though for an industry that is more than 800 years old, change does not occur easily or rapidly.

This should be exciting to future IT leaders. We are part of the problem—inciting disruption—as well as part of the solution. An IT leader needs to focus more on the “leader” than on the “IT;” but the job still requires understanding trends, knowing what is real and what is ephemeral, gaining credibility from all stakeholders—inside and outside of the IT organization—and being viewed as relevant to the evolution of the organization. This is a big list, and few will be able to excel at everything.

Finally, future IT leaders must recognize that higher education institutions do not typically distinguish themselves by the quality of their technology. Going forward, this will be increasingly the case as more operations are moved off campus. This doesn't mean that CIOs and CTOs will become irrelevant. It means that their value to the institution will be in ensuring that campus and community members have the right technologies and services, no matter where those technologies and services are sourced.



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2016 Community Leadership Award

EDUCAUSE recognizes Timothy Chester as an ongoing champion for information technology organizations and how they can inform and influence broader higher education strategy and policy. Tim is also an advocate for leadership strategy and organizational change, having elevated the CIO role to the VP level at both Pepperdine University and the University of Georgia (UGA). In his current position as vice president for information technology at UGA, Tim has focused on strategies to elevate the work of the IT and Institutional Research organizations and their influence and impact at the university. Since his arrival in 2011, he has revamped the institution's central IT organization to ensure that its day-to-day work is

Timothy Chester

—For his exemplary and wide-ranging sphere of influence in the higher education IT profession; for extraordinary thought leadership in IT service assessment, management, and delivery; for mentorship and advancing professional development within the higher education community

aligned with the university's strategic initiatives and has facilitated systematic, stakeholder-focused improvements in the delivery of IT services.

Tim's career trajectory began at Texas A&M University at the entry level of the IT organization, but within six years he was asked to assume the role of CIO in charge of establishing a broad range of services for a new college of engineering at the university's Qatar branch campus. Next, Tim held leadership positions at Pepperdine University, where he led the development of the university's strategic plan and regional reaccreditation



“We learn so much from sharing our ideas with others, allowing them to influence our ideas while we simultaneously influence theirs.”

process while also transforming the school's IT operation into an effective service model encompassing strategic areas such as analytics, institutional research, and teaching and learning. The Pepperdine reorganization was recognized with a 2011 *Campus Technology Innovator Award* for Leadership, Governance, and Policy.

A hallmark of Tim's career is his interest in studying the barriers limiting effective IT service delivery. For nearly a

decade in his work as leader of the TechQual+ project (<https://www.techqual.org/>), Tim has advised others on how they can assess and improve IT services at their institutions. To date, more than 100 institutions have used the TechQual+ survey as a way to develop sound planning, continuous improvement, assessment practices, and organizational change. Tim has been the guiding force behind this innovative assessment tool.

Tim has also worked as an advocate for professional development and as a generous and insightful mentor to others. He has guided and supported EDUCAUSE professional development as a Program Committee member and presenter, and he is regarded as a thoughtful, provocative, and innovative speaker. As director of the Hawkins Leadership Roundtable, he has brought incredible energy and excitement to the program. He has written on a variety of subjects of interest to the community in numerous EDUCAUSE and ECAR publications and elsewhere. And he engages the larger higher education community by sharing his perspective on Twitter and on his EDUCAUSE and personal blogs under his trademark handle “accidentalCIO.”

Tim's outstanding qualities as a thought leader, innovator, role model, and mentor have strengthened the entire higher education community.

EDUCAUSE Review: What can you tell us about the Higher Education TechQual+ Project and its benefits for the higher education community?

Chester: This project has kept my work as an IT practitioner and leader firmly grounded in the academic research that is expected of my work as a faculty member. Knowing that so many times, IT leaders find themselves responding to anecdotal feedback from students and faculty, we have aspired to build a set of tools for collecting empirical data on the quality of campus IT services while also providing IT practitioners with a set of easy-to-use, web-based tools for conducting survey research. From the perspective of MIS researchers, and through a series of focus groups, we've developed a survey that we believe encapsulates the very specific things that students, faculty, and staff want from their IT organizations: rich connectivity, better collaboration tools, and a strong support experience. The project has been operational for a decade, and we have over 350,000 completed surveys from more than one hundred institutions. The singular goal is to provide IT practitioners with a firmer basis for planning and resource allocation decisions. The survey is available free of charge, with the work generously supported by the University of Georgia as a part of my appointment as an executive and member of the faculty.

EDUCAUSE Review: What advice do you have for young IT professionals about how to get involved in supporting the work of our community?

Chester: I think first, we try to instill the idea that collaboration with others—both at each institution and in the broader community of higher education—is a vital personal and professional development experience. We learn so much from sharing our ideas with others, allowing them to influence our ideas while we simultaneously influence theirs. That type of connectedness and collaboration is a cornerstone of human experience, and it's what develops strong individual and team contributors. I think we should try to encourage people not to be bashful about sharing their good ideas, whether talking about those ideas in a community forum, a presentation, or a blog or other written narrative. We also should make sure that from a time and resource perspective, professional development is something that is a priority for our organizations. At the University of Georgia, we have a regular, standing budget commitment to professional development each year, regardless of whether it is good economic times or bad. We also make sure that our staff are afforded the time to take advantage of the myriad of opportunities that are available to them. We have a very

large mentoring program in our organization, as well as opportunities within the university and through outside organizations such as EDUCAUSE.

EDUCAUSE Review: How can IT professionals build community and make it sustainable and scalable? Do you have suggestions for gaining institutional support for community work?

Chester: I hope that I don't tread too much into something that makes me unpopular, but I think that in order to make our community more sustainable, we've got to get it out of the box that sometimes we and others put ourselves in. What we do is pervasive, but when I walk around an EDUCAUSE event I tend to not see very many people outside the IT profession. Every major area in a higher education institution is represented by a trade association like EDUCAUSE. I think that we as a community have to become more interdisciplinary and forge better ties with all the other professions that those associations represent. In ten years, I would love to walk around an EDUCAUSE event and know that there are presidents, provosts, faculty, and others outside our profession in attendance: student affairs professionals, admissions professionals, development and fund-raising professionals, and institutional research professionals. We've done a good job of outreach to the

others to influence your own work and thoughts while simultaneously accepting the responsibility of doing the same for others.

EDUCAUSE Review: What do you think are the most significant forces at work in higher education today, and how should the community respond?

Chester: My greatest worry is that the members of my generation of higher education leaders are not doing enough to make sure that the cost of a college education remains within the financial reach of everyone who aspires to one. If we do not find better ways to dramatically slow (or roll back) the costs of tuition and fees, I worry that by the time I retire,



“Success is going to require us to be less about the nuts-and-bolts and bits-and-bytes and more about solving problems that fundamentally reform higher education for the better.”

library profession, but we need to broaden that outreach considerably. Because of the changing nature of technology, I believe that if our profession remains in the technology implementation and operations box, it will be a shrinking discipline. Success is going to require us to be less about the nuts-and-bolts and bits-and-bytes and more about solving problems that fundamentally reform higher education for the better. That's what we must do if our profession/association is to remain sustainable over the next decade.

EDUCAUSE Review: What is your secret for successfully balancing institutional leadership with service to the community?

Chester: I've always allowed my community service with EDUCAUSE to be an extension of my institutional work. If you peruse my EDUCAUSE profile and look at the series of presentations and publications over the last fifteen years, you will see that they reflect the institutional work that I was engaged in at the time. With the creation of TechQual+, many of my publications, presentations, and forums were associated with that project. When I was involved in reforming our HR practices at Pepperdine and UGA to become more competency-focused, my EDUCAUSE presentations and publications were on that topic. Today, with my work in institutional research, my engagement in the community is on topics of data and analytics. I think this pattern of activity reflects what I said earlier about personal and professional development being inexorably linked to collaborations with others and about the ability to be confident enough to allow

the higher education experience that both I and my children benefited from will be available only to those with the most economic means. My wife and I have our first grandson now, and we did the math: assuming that college tuition grows at a 7 percent annual rate between now and the time he graduates from high school, the cost of a good public school higher education will be approximate to tuition and fees at this country's most exclusive private institutions today. If that happens, we will have reversed course to pre-GI Bill days, when a college experience was an opportunity only for the most affluent, and our country will have lost one of its most vital engines of innovation, economic growth, and community development. Getting in front of and responding to this challenge is the burden for my generation of higher education leaders.



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2016 Rising Star Award

EDUCAUSE recognizes Emily Lynema for her outstanding record of achievement in the development of user-centered technology applications and for her innovative and collaborative approach to IT development.

Associate head of information technology and director of academic technology at the North Carolina State University (NCSU) Libraries, Emily has contributed greatly to the institution's reputation as a leader in the development of forward-thinking library technologies. Emily started her career as a software developer for the NCSU Libraries,

Emily Lynema

—For pioneering contributions in the library technology community within higher education; for leading the development of user-centered technology applications in support of the institution's overall teaching, learning, and research program; for exemplifying the qualities of a rising star in higher education information technology

where her first project was on the libraries' groundbreaking faceted catalog interface, one that incorporated features from e-commerce sites to provide a more intuitive browsing experience for library users. Debuting in 2006 as the first interface of its type, the catalog garnered national recognition for the NCSU Libraries and became a model for more modern search interfaces for library materials. *Library Journal* named Emily one of its "Movers and Shakers" in 2007 for her work, which influenced the kinds of next-generation catalog interfaces that are now standard.

While continuing to be a pioneer in information discovery and management, Emily has expanded her efforts to include work supporting large-scale, immersive visualization, game development, acoustic modeling, and sensor systems. In her current position, she oversees the work of the Discovery Systems unit, which develops and supports core business applications for resource discovery, delivery, and wayfinding in the NCSU Libraries. As part of her recently expanded portfolio, she also manages the Academic Technology unit, which assists faculty and students in the use of advanced technologies for research, teaching, and learning, including support for the NCSU Libraries' high-tech spaces and investigation of new and emerging technologies.

Emily also served as co-PI and project director for ALICE (Adaptive Learning Spaces & Interactive Content Environments). This grant, funded by the Institute of Museum and Library Services, aimed to develop and prototype a conceptual model on which adaptive learning environments can be built in order to enhance or improve the learning experience for users.

Emily has also been active in the Triangle Research Libraries Network (TRLN), the Quali Open Library Environment project (OLE), and other national committee appointments. She has an extensive record of publications and presentations and was invited to participate on the Digital Library Federation's Integrated Library System Discovery Interface Task Group to develop specifications for services required to integrate library software with next-generation discovery systems.

Emily is a natural and innovative leader in the field of library information technologies, bringing enthusiasm, keen insight, and creativity to every project in which she is involved and setting a standard for the profession.

EDUCAUSE Review: What advice do you have for those just getting started as IT professionals in higher education?

Lynema: Give yourself some time to settle in. Higher education runs at a different pace than the corporate world and has its own set of values and priorities (and budgets). These differences can be disconcerting at first; they have been for many technical staff I have hired. The challenges are no less important, and no less daunting, however, and there are many opportunities to solve complex problems. Take the time to connect with others in your workplace and learn about the difficulties they are facing and the work they are trying to accomplish. Really understanding what we are doing, and why, will help you make the right choices in design and implementation of technology in higher education. It's a huge benefit to the organization to have IT professionals who can help creatively brainstorm solutions that address underlying problems, even in the face of resource constraints.



EDUCAUSE Review: Any suggestions or "lessons learned" for other women IT professionals with aspirations of career advancement?

Lynema: Many women feel pressure to be heavily involved in both professional careers and family life. Don't assume you have to spend 80 hours a week in the office to advance your career (unless you want to). It's not necessary to work endless overtime to show you have the capacity to become a leader. Start instead by caring enough to do your job well. Keep your eyes open to what is going on around you, ask questions, and look for opportunities to help tackle thorny problems that cut across the boundaries of your work area. Most likely, you won't be able to

“If you demonstrate your ability to effectively lead initiatives and think strategically at a smaller scale, you've taken the right first steps to advance your career.”

do everything that you would like to, so prioritize, delegate, and say “no” based on what is important to your organization. If you demonstrate your ability to effectively lead initiatives and think strategically at a smaller scale, you've taken the right first steps to advance your career.

“The use of technology to enhance creative learning is exploding in higher education, and libraries are well positioned to provide democratized access to learners across the institution.”

EDUCAUSE Review: Who inspired you when you started in your career, and who inspires you now?

Lynema: I am often most inspired by the peers I work with on a regular basis. For example, I recently began to acknowledge the difficulty I have had thinking and engaging deeply with individual problems since I gained responsibility over a broader swath of our IT organization. So it was incredibly inspiring to sit in on an internal interview with a peer in my organization and listen to his process for systematically approaching complex problems. It reminds me of how much I can learn from those around me. I'm also inspired every time I hear a story of how a staff member identified a problem facing our students, faculty, or staff and put in the time and effort to come up with a creative solution that made a difference. That's exactly what I want to do, and it gives me that extra bit of motivation when others remind me what we can accomplish together.

EDUCAUSE Review: What can others in our community do to support young IT professionals?

Lynema: Take a moment to see the potential in others. I would likely not be in my current position at my organization if someone had not stepped up to tell me that I had what it took. Sometimes we want to keep people working in their current role because they are good at it and because trying to replace them would be painful. Instead, offer them opportunities to grow in responsibility, even if it means they end up leaving for another position. On the whole, the community of higher education will likely be better off.



Most young IT professionals want to be involved in significant, meaningful work. You can help support them by providing organizational context and then including them in broader conversations in which solutions are being discussed. This is a great opportunity to give them the chance to move beyond technology implementation and into a role of leadership and problem solving within your organization. Don't assume they are bored stiff in meetings; ask them if they would like to participate.

EDUCAUSE Review: What excites you about libraries, information technology, and higher education today?

Lynema: Libraries around the United States are transforming their reputation and identity as they become centers for learning and collaboration, and that is very exciting for those of us who are looking toward the future. Libraries have always provided centralized access to resources that were too difficult for individuals to acquire on their own. For many years, these resources were books. More recently, libraries have been enabling access to ultra-expensive online scientific journals and databases. With the dawn of the Internet, libraries began providing centralized access to technology such as desktop computing. The use of technology to enhance creative learning is exploding in higher education, and libraries are well positioned to provide democratized access to learners across the institution. I think makerspaces and visualization spaces are just the start of this movement. Libraries are poised to identify new technology that can impact research, teaching, and learning and to find ways to help students and faculty employ that technology to their benefit and the benefit of the institution as a whole. ■

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Enterprise IT Summit 2017

Serving and Succeeding Together

February 27–March 1, 2017 | Phoenix, AZ

Meshing finance with technology planning is as important as developing a financial plan alongside a facility master plan.

The 2017 summit will consider how CIOs and CFOs can work together to prioritize investments and understand the full cost and benefit of technology; the impact of cloud services on budget strategies; governance and decision making related to IT spend; and what it really means to work across the institution in a collaborative relationship.

Registration opens in November.

Find out more at edUCAUSE.edu/ent17.

EDUCAUSE RESEARCH SNAPSHOT

2016 RESEARCH HIGHLIGHTS

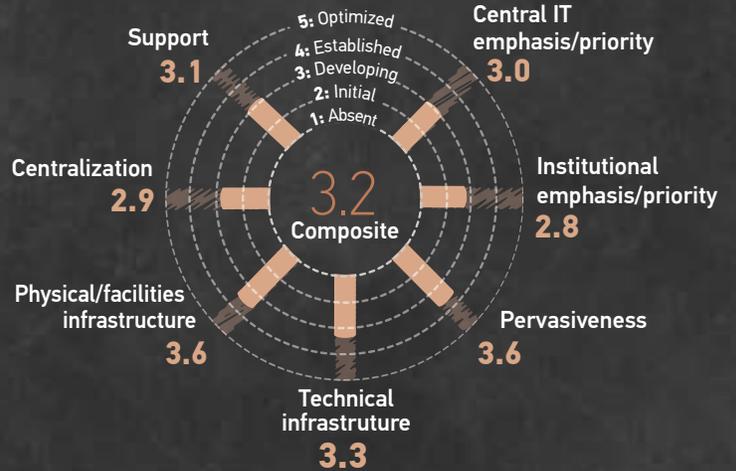
Looking back to sketch the future

RESEARCH COMPUTING

Nearly 300 institutions assessed their research computing strategic capabilities in 2015. Use the EDUCAUSE Benchmarking Service to assess your research computing maturity.

Benchmarking can help calibrate institutional priorities, compare current practices with those of peers, and measure progress toward improvement goals.

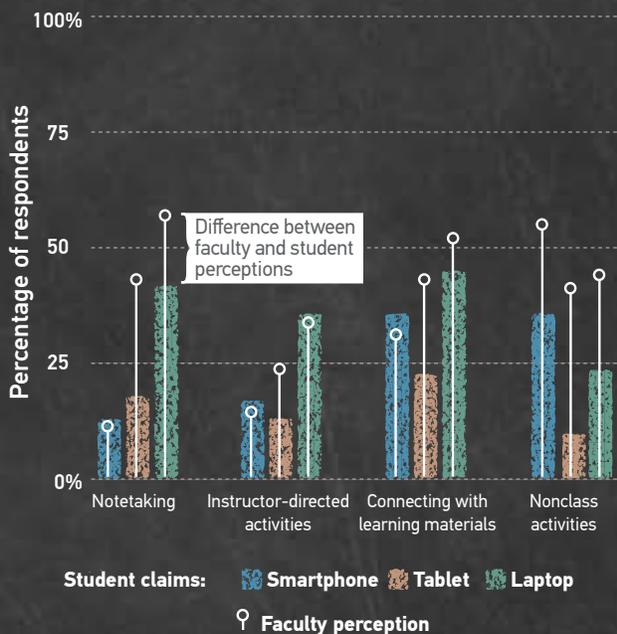
EDUCAUSE Benchmarking Service Maturity Index of scores across institutions for research computing



TEACHING & LEARNING

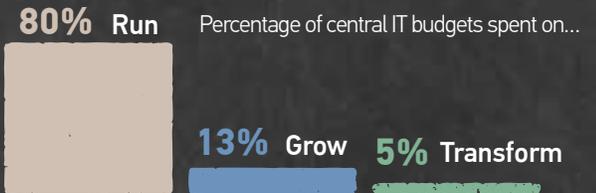
Comparing findings from the student and faculty studies highlights the differences between how students say they use their devices in class and how faculty think students use them.

Understanding these differences can inform strategies to help faculty use students' devices in meaningful and engaging ways during class.



IT FUNDING MODELS

Developing IT funding models that sustain core services, support innovation, and facilitate growth was #6 on the 2016 Top 10 IT Issues list.



SECURITY AWARENESS

Most higher ed respondents to a recent SANS survey said they have less than \$5k to spend on security awareness and devote no more than 15% of their time to awareness tasks.* Higher ed takes a more ad hoc/opportunistic approach to security awareness plans than other sectors.

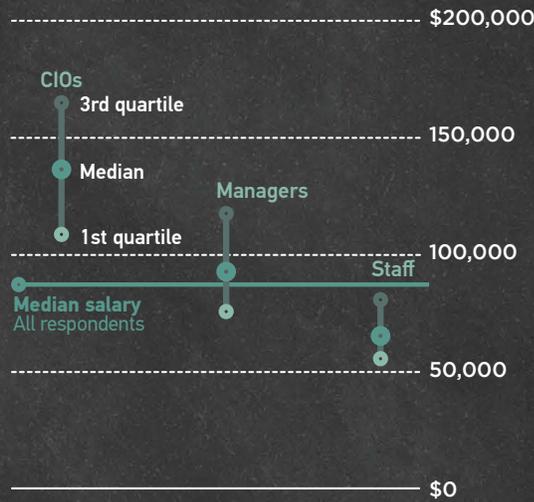
* Joanna L. Grama and Eden Dahlstrom, *Higher Education Information Security Awareness Programs*, research bulletin (Louisville, CO: ECAR, August 8, 2016).

EDUCAUSE research helps you sketch a better plan of action for the future. Revisit the previous 2016 EDUCAUSE Research Snapshots for key data points about personalized learning, the future of work, the Internet of Things, and analytics. A sample of the expanded research portfolio is profiled below.

IT WORKFORCE

In 2015, more than half (53%) of central IT spending went to employee compensation, yet little is known about the factors that determine salary levels.

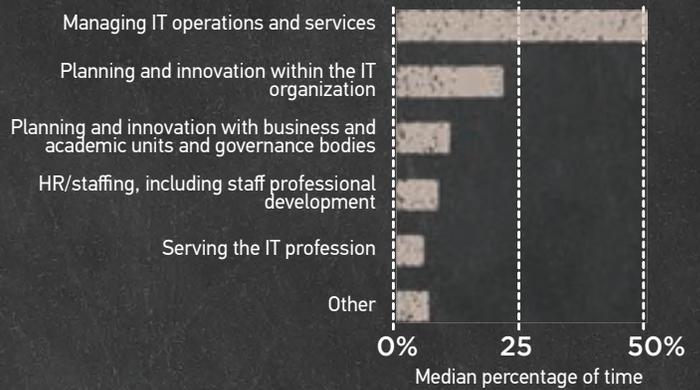
2016 ECAR research explored the factors that determine employee salaries.



IT SERVICE DELIVERY

Delivering IT services is becoming less about managing physical infrastructure and tech resources and more about managing vendors, services, and outsourced contracts.

This shift is reflected in the amount of time managers say they spend on various tasks:



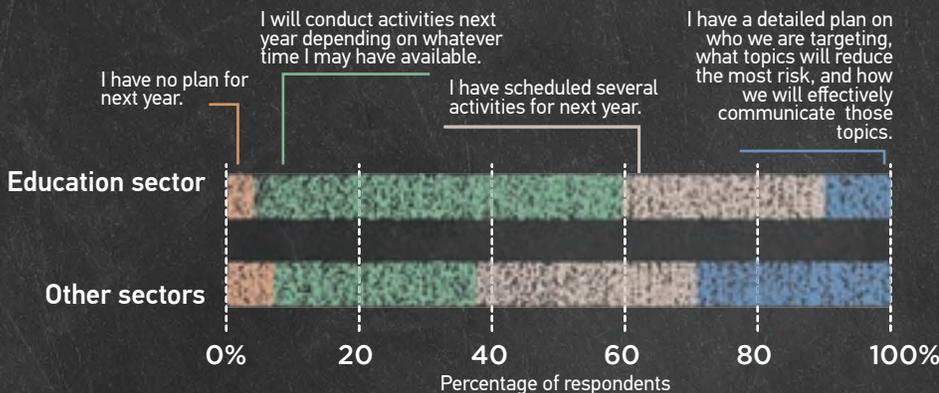
ANALYTICS

Developing or expanding analytics services requires the right kind and right number of staff.

The skills with the highest demand are:

- Predictive modeling
- Data visualization
- User experience
- Analytics tool training
- Data analysis

Organizations with 2015 security awareness program plans



Enhance decision making with these EDUCAUSE resources:

- Core Data Service: www.educause.edu/coredata
- EDUCAUSE Benchmarking Service: www.educause.edu/benchmarking
- EDUCAUSE Center for Analysis and Research: www.educause.edu/ecar

With trends, benchmarking data, and analysis, you can zero in on what's important and where to focus.

Mobile and Community Colleges

In “Community Colleges: Somewhat Different,” a recent *Connections: Community College Insights* column, Bret Ingerman addressed a number of issues regarding the role of information technology in community colleges and the conversations that community college IT organizations need to have to help support our students.¹ One area to discuss is how to ensure that our Internet/web-based systems can be used by our students. Our role must be to look at who our students are and at the available data on what technology our students have and how they access the Internet.

Who Are Our Students?

While each community college is based in its own community, offers programs to support that community, and has a unique student body composition based on geography, national data can help us understand who we serve overall. In looking at the general trends in community college enrollment, we find that although the individual composition of each community college differs, we share these national trends:

- The average age is 29.
- Traditional-age students (18–24) make up about 50 percent of our students.
- The majority are first-generation students.
- A significant number are single parents.
- The majority work while taking classes.
- Over half of our students are from the lower two SES (socio-economic status) quartiles.²

Data: How Students Access the Internet

A plethora of studies, white papers, and data points demonstrate how incoming traditional-age students research selective colleges, but in my mind, there is always a question of how these facts relate to community college students. Yes, some community colleges are seen as “preferred” educational institutions—if not for all classes, perhaps for certain areas, such as wind-power, nursing, or nanotechnology—but overall, the general perception about community colleges is that they aren’t usually a school of choice.³ We do what we can to combat that perception—by underscoring our value, highlighting our unique programs, and showing off our successful graduates—but I’ve found no studies that show how students research and actively select a community college.

However, there are more generalized studies about how people use the Internet, and this is where knowing our students is critical. The first time I looked at this data, my institu-

tion was moving a website to responsive design, and we were looking at both our analytics and national studies. The Pew Center for Research always has current studies on the Internet, and these three had the most recent and relevant data: *U.S. Smartphone Use in 2015*; *Technology Device Ownership: 2015*; and *Home Broadband 2015*.⁴

One of the key statistics of these reports is that low-income students, or those with lower educational attainment, are most likely to have a smartphone as their only access to the Internet. From our general data, we know that these particular groups make up a significant percentage of our student population. The *U.S. Smartphone Use in 2015* data shows that 30 percent of all smartphone users have used their smartphone to take a class or get educational content, whether or not they are smartphone-dependent.⁵

Home Broadband 2015 reaffirms that for these same groups, the cost of broadband is too expensive, and as the capability of smartphones has grown, these groups have come to increasingly rely on smartphones as their primary access to the Internet.⁶ Similarly, the *EDUCAUSE Review Connections* column “E-Learning, the Digital Divide, and Student Success at Community Colleges” also points to U.S. Department of Commerce data that reinforces that the key populations of community colleges have limited home Internet access.⁷

The studies also point out that these students may have no other technology—making it critical that we provide digital resources in a mobile format.

What Can We Do?

What does this mean for community colleges? It would appear that we need to ensure not only that our websites are mobile-friendly but also that all of our systems are mobile-capable.

These systems include our student information systems (registration, grades); course management systems; payment systems; library systems; internal portals; academic support systems (degree audits, early intervention, advisor appointments); and any internally created forms, applications, or software. In short, any system or software that a student would use to do business or learning at the college should, ideally, be mobile-ready. With limited personnel and budgets—and with the ever-growing dependence on technology—this is a tall order for any IT department.

Even though I am talking here about community college students, data shows that all students expect and rely on smartphones. For example, according to the “EDUCAUSE Almanac for Undergraduate Student and Technology Survey, 2016,”



By JULIA GRAY



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96 percent of students own a smartphone, and a majority say that being able to do academic activities (90%) or administrative activities (78%) on their smartphone is at least moderately important.⁸ For community college students, the statistics imply that this is vital for these activities, since they have no other way to access the Internet.

At Oakton Community College, we've started to meet this need. We've recently finished our move to a responsive website, we're in the midst of upgrading our student (and employee) portal, and we're planning the upgrades to make our student record system mobile-friendly. We've expanded our activities in social media (since that's already mobile-friendly), and we are integrating mobile-friendly videos. We are still reviewing other systems and programs, and we are working on our internal outreach to ensure that the college community understands the need to focus on, and hopefully prioritize, this issue.

Circling back: we have started our conversation, and we have taken our first steps. Hopefully, other community colleges will initiate and continue these conversations as they look at this critical data. ■

Notes

1. Bret Ingerman, "Community Colleges: Somewhat Different," *EDUCAUSE Review* 51, no. 4 (July/August 2016).
2. Anthony P. Carnevale and Stephen J. Rose, "Socioeconomic Status, Race/Ethnicity, and Selective College Admissions," *A Century Foundation Paper*, March 31, 2003; American Association of Community Colleges, "Fast Facts," February 2016; Christopher M. Mullin, "Why Access Matters: The Community College Student Body," *AACC Policy Brief 2012-01PBL*, February 2012.
3. Kate Barrington, "Why Do Community Colleges Get a Bad Rap?," *Community College Review*, November 05, 2015.
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6. Horrigan and Duggan, "Home Broadband 2015."
7. Susan Kater, Robert Soza, and Lisa Young, "E-Learning, the Digital Divide, and Student Success at Community Colleges," *EDUCAUSE Review* 51, no. 5 (September/October 2016).
8. "EDUCAUSE Almanac for Undergraduate Student and Technology Survey, 2016" (June 2016).

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Preserving Scientific Software ... in a Usable Form?

The scientific method is based on scientific experiments being verifiable through reproduction. Today, however, some in the scientific community are concerned about the replicability of scientific research. Part of the problem is that given page limits imposed by most publishers, it is generally difficult, if not impossible, to describe scientific methods in sufficient detail to enable the research to be replicated. Furthermore, scientific research is today particularly likely to be viewed as a subject of political debate because there are so many topics of intense concern and interest to the public—from global climate change to genetically enhanced food sources. Those of us who are scientific researchers owe it to each other to make our research as easily replicable as possible. And we owe it to the taxpayers, who fund our research, to minimize the ability of people who critique research to distort its meaning or question the results of research on the basis of politically or financially motivated concerns.

Recently, interesting work has been published related to the replicability of experimental findings, such as an attempt to replicate studies in experimental economic research.¹ In this article, I follow earlier distinctions between *replicability* and *reproducibility*. By replicability, I mean the ability to replicate an experiment as closely as possible and get generally the same result. The words “as closely as possible” are important: an experiment about an animal population in the wild in a particular area cannot be exactly replicated if the range of the species has moved and is no longer present in the area where an experiment was conducted. On the other hand, if one has the data from a research project, then it should be possible to precisely reproduce the analyses of the data in every detail, extend the analysis if appropriate, and/or correct errors if they exist.

In theory, one should be able to exactly reproduce the data analysis done as part of any research publication. In practice, doing so is hard. Part of the reason this is difficult is that so much of the data analysis is simply not included in published papers, as depicted in figure 1 from James Taylor, one of the creators of the Galaxy bioinformatics software environment.

Another reason it is hard to reproduce scientific data analyses and simulations is because of all the things one must specify in order to make reproducibility possible. Even if you use open-source software, “I used version x of the commonly used open-source software package X” is often all the space one gets. Important details such as which patches, from

where, running in what operating system, compiled with what compilers, and using which mathematical libraries are usually omitted. Describing the software environment used for a particular analysis gets very tricky very quickly.

There are very important and useful open-source software repositories available today, notably SourceForge (<https://sourceforge.net>) and GitHub (<https://github.com>). Researchers can make a particular simulation or data-analysis task reproducible by depositing sufficient directions, data sources, copies of output, etc. within one of these repositories. For example, my former (now deceased) colleague Richard Repasky made his published research analyses reproducible by making a .tar file of everything needed to replicate his computer analysis. These .tar archives included the Linux distribution, source code, and make files he used to compile the open-source R software he used for his analysis, along with input data, scripts, and output data. All of these analyses were done with one CPU core in an x86 processor. As long as one can find either an x86 processor or an x86 emulator, one can rebuild the environment he used for any of his published papers and can reproduce his analyses. But doing this takes a fair bit of knowledge and time.

Workflow management systems and virtualization environments are helping to make data analyses and simulations reproducible. Examples of such efforts include RunMyCode, Globus data publication, the Galaxy bioinformatics workflow engine, the Jetstream cloud computing system, and Project Aristotle.

RunMyCode (<http://runmycode.org>) is a highly useful service that enables a researcher to create a companion website to accompany a publication. It is perhaps the most generally available and widely used tool to publish the information, software, and data needed to reproduce scientific data analyses and simulations. However, RunMyCode does not actually provide a place where one researcher can run another researcher’s code.

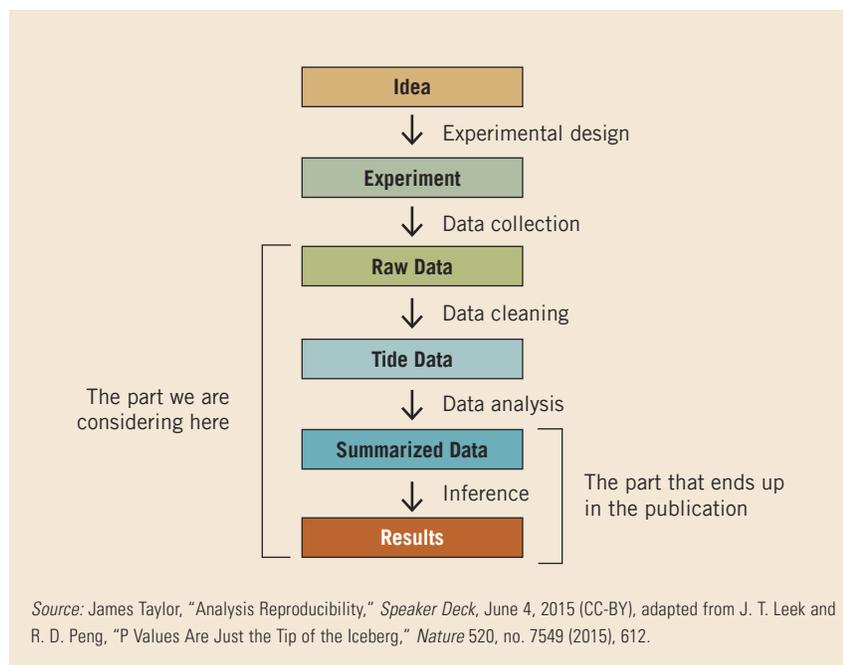
Similarly, the Globus data publication (<https://www.globus.org>) tool makes it possible to publish research data on your own storage systems with standard metadata and curation workflows.

The Galaxy (<https://galaxyproject.org>) bioinformatics workflow engine is designed to make bioinformatics analyses reproducible, and this initiative has already contributed greatly to the reproducibility of biological research. The website includes a gateway to run a workflow in Galaxy; a



By CRAIG STEWART

FIGURE 1. DEPICTION OF DATA ANALYSIS PIPELINE



workflow run in Galaxy and made available publicly with the relevant data and copies of output should be replicable in other Galaxy workflow portals.

Cloud technology is providing additional new tools for enabling reproducibility of analyses. Jetstream (<http://jetstream-cloud.org>) is an example of a science and engineering cloud implemented with enabling reproducibility of scientific research as one of its critical functions. Jetstream is the first production cloud supporting scientific research funded by the National Science Foundation. It uses the Atmosphere interface and is available to any researcher doing open (nonclassified) research at an institution of higher education in the United States. The team operating Jetstream makes available to all users a library of "featured" virtual machines (VMs). These are VMs that provide commonly needed functionality. Jetstream guarantees that they will work properly and, if not, that they will be fixed promptly. There is also a category of VMs that are contributed by one research team for use by others—these are called "contributed" VMs. An individual researcher can use any of these VMs and then store versions—with, for example, data and scripts—in a private VM library. Jetstream thus provides a means by which researchers can distribute scientific software so that other researchers may discover and use it without the headaches of downloading it to a local system.

In addition to the general ability to disseminate and use software within an OpenStack VM, Jetstream provides data-storage and data-publication capabilities that will aid reproducibility of scientific research. Researchers who do analyses with Jetstream may upload a VM image to Indiana University's

digital repository (IUScholarWorks) and associate a Digital Object Identifier (DOI) with that VM. This means that researchers have the opportunity to make available a VM containing the entire lifecycle of their research—input data, scripts, all of the programs used to analyze the data, and output data—in a way that allows other researchers to discover that VM through a DOI cited in a paper. A researcher can publish a paper, perhaps with a companion page made via RunMyCode, and provide a VM that any other researcher can download and then run on Jetstream or another OpenStack-based cloud. This provides a very straightforward mechanism for reproducibility of scientific analyses. (Indiana University has committed to make these VMs available "for the foreseeable future"—concretely at least five years past the end of federal funding for Jetstream.)

Project Aristotle (<http://federatedcloud.org>) aims to take this sort of reproducibility and extend it a step further—making it possible to run VMs across multiple different cloud environments. Already researchers working with Project Aristotle have taken one VM and run it on Cornell University's Red Cloud system, Jetstream, Amazon Web Services, and Microsoft Azure cloud services.

The portability and reusability of VMs provides a practical, straightforward way for researchers to exchange an entire scientific analysis within the confines of a single VM image. This means that scientific software can be preserved as it is used in a particular research project, thus enabling reproducibility of scientific research. In particular, reusability in the form of VM images—with software, data, and results—enables preservation and reusability of software, and thus reproducibility of analyses, in ways that seem relatively manageable to a typical practicing researcher and that will make publication and reuse of data and software a more common and straightforward part of the scientific method as practiced today. ■

Note

Jetstream is supported by NSF grant award 144506 and by the Indiana University Pervasive Technology Institute. Any opinions expressed here are those of the author and do not necessarily represent the views of the organizations that have supported research that contributed to this column.

1. John Bohannon, "About 40% of Economics Experiments Fail Replication Survey," *Science*, March 3, 2016.

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Life101: A Q&A with Michael Wesch

Michael Wesch has long been a leader in changing the ways we view teaching and learning. He converts large lecture halls into active, team- and game-based learning environments, and his digital ethnography courses co-create projects that can transform the lives of students and the communities with which they engage. In August, Wesch rolled out his newest project, *Life101.audio* (“Real Stories about Real Students Seeking a Real Education”). This podcast series seeks to renew one of the essential aspects of education: opening up to and embracing the “quest” for learning that focuses on discovery and on the connections between intellectual, affective, real-world, and personal curiosity. The approach that Mike takes to improve education goes against some current trends, which reduce learning to measuring “mastery” of information. His work continues to remind us to broaden, rather than narrow, what our learning outcomes should encourage for students (and faculty). As my work as this year’s editor of the *EDUCAUSE Review* New Horizons column comes to a close, I am delighted to feature a brief Q&A with Mike about the *Life101.audio* project.

—**Shelli Fowler**, Interim Dean, University College, and Director of the Bachelor of Interdisciplinary Studies, Virginia Commonwealth University

Fowler: You’ve been exploring a “participatory” praxis that challenges you and your students (and all of us who teach and work with students) to explore new and uncomfortable learning challenges and then to narrate and share those experiences.¹ You suggest that doing so helps us remember and relearn how to open ourselves up and conquer the fears and doubts that obstruct what you call “real education.” What is the idea behind your latest project, *Life101.audio*, and what impact is it having on your approach to teaching and learning?

Wesch: *Life101.audio*, a storytelling podcast similar to *This American Life*, focuses on student life. To produce the stories, I have been immersing myself in the lives of my students, not only Snapchatting, Yik Yakking, and Tweeting but also going to parties, dancing at bars after midnight, or just hanging out at the dorms. Participation is the essence of anthropology. We don’t learn about a culture by simply observing it; we have to immerse ourselves in a culture to really understand it from the native point of view. My basic methodology is to go out

with students and then follow up with in-depth interviews. For example, in Episode 1 (“Professor’s Night Out”), I go to a frat party and bump into a couple who were meeting for the first time. I interviewed them three months later to produce a segment about the challenges of starting a relationship. I also met a Chinese international student who taught me how to dance. I connected with him a few weeks later to produce a story about his journey to Kansas and worked that into the story of his teaching me how to dance. All of these stories come together in each episode so that *Life101.audio* becomes a series of stories that I come across as I do my research into college life.

Fowler: Many faculty and IT professionals are concerned about the increasing drive to narrowly quantify postsecondary learning. In your initial *Life101.audio* podcast, you make a distinction between different types of student learning outcomes (SLOs): those that are “measured” through multiple-choice exams and those that might better indicate the depth, breadth, and impact of learning. How does your new project attempt to reach beyond traditional, normative assumptions about what is at the heart of education?

Wesch: My first night of research, which is featured in Episode 1, was a real eye-opener for me. I had been invited out by a group of students to climb buildings—a risky endeavor in which you have to dodge campus security while doing a series of parkour moves up fire escapes, railings, ladders, and ledges to make your way to the top of campus buildings. I was amazed at how passionate and intensively these students were pursuing this goal. And I realized that if we could somehow nurture that same kind of passion in the classroom, grades would be irrelevant. The students were, in fact, testing themselves. They were testing their courage, their skill, and their determination. And they will continue to test themselves—over and over again. If we could somehow create learning outcomes worth pursuing, we might get the same kind of engagement.

Unfortunately, while SLOs are a very well-intentioned invention and hold the potential to transform learning, they are often encountered by faculty as an imposition from above and as, at best, a bureaucratic necessity or, at worst, an Orwellian surveillance mechanism to monitor faculty performance. As a result, many SLOs are written to ensure that they are easily measured and easily accomplished within the time frame of the course. Meanwhile, most of us have much more profound goals that go unexpressed and are often



forgotten in the day-to-day turmoil of the semester. Almost all faculty members will tell you that they are interested in nurturing critical thinking, creative thinking, and problem solving. But consider what those activities really entail. They are not simple skills and procedures that can be learned in the classroom. There are no clear formulas to memorize and execute. And, six decades of research on students and how they change show that such forms of thinking are complex psychosocial and cognitive-structural developments. In other words, those abilities are not just “stuff” you learn. They are ways of being—hard-earned through the trials of life. Indeed, mustering up the courage to parkour to the top of a building is not irrelevant to this, nor is mustering up the dedication and determination to try again. As Neil Postman notes, you can engineer the learning of bits, things, and simple procedures. “But to become a different person because of something you have learned—to appropriate an insight, a concept, a vision, so that your world is altered—that is a different matter.”²

“We don’t learn about a culture by simply observing it; we have to immerse ourselves in a culture to really understand it from the native point of view.”

Fowler: Your *Life101.audio* project embraces the difficult question about how we must transform our approach to teaching and learning so that the way we view and interact with our students is radically different from what it is now. Institutions of higher education, though, rarely encourage faculty (who often feel disconnected from contemporary learners) to bridge the gap in the ways you are willing to do. You express the perfect Freirean balance of teaching and learning roles when you say about Jordan Thomas, your former student, that over time it became increasingly unclear “who was the student and who was the teacher.”³ How can the IT and learning technology communities in higher education support and help foster the kind of exploratory pedagogy and transformative learning (for students *and* faculty) that *Life101.audio* represents?

Wesch: We are at a critical crossroads in education technology, and the direction we go depends largely on how we think about education. If we think about education as the learning of bits of information, we will build highly sophisticated mechanisms for delivering these bits and assessing whether or not the bits have been learned. This has largely been the path of adaptive learning platforms and the promise of algorithmic “personalized learning” systems. The algorithms used in these programs are not epistemologically neutral. They require knowledge to be defined in terms of bits that can be easily delivered and assessed. Jose Ferreira, CEO of Knewton, calls the bits “atomic concepts.”⁴ These concepts are then arranged into a larger structure in such a way that the student

must master certain basic facts before proceeding onto higher-level ones. Seymour Papert calls this the “cathedral model for education,” noting that the curriculum designer “is cast in the role of a ‘knowledge architect’ who will specify a plan, a tight program, for the placement of ‘knowledge bricks’ in children’s minds.”⁵ Sal Khan’s attempt to create a Knowledge Map spanning across virtually all disciplines is perhaps the most rigorous manifestation of the model.

There are many problems with this epistemology. First, it sees the user as a version of itself—a computer operating with pure logic and a programmed-in motivation to learn the material. Of course, real students are not like that at all. They are deeply enmeshed in a field of relationships. They represent a vast variety of beliefs, ideas, ideals, and values. Second, and most importantly, students are primarily meaning-seeking individuals, not information-seeking automatons.

This is not to say that algorithms do not have a role in education. These technologies have great potential and will serve learners very well at different stages in their journeys. We just have to make sure that we don’t allow the technology to seduce us into thinking that these algorithms represent the ultimate goal of education.

My hope is that the stories I tell in *Life101.audio* are a constant reminder of what a real education looks like. Much of what it takes to think critically or creatively or to solve complex problems is embedded in hard-earned character traits like the capacity to overcome doubt, embrace fear, or be comfortable in ambiguity. These are earned through practice, and practice is best when it occurs in a community of like-minded, passionate people. We need to make sure that we continue to build the technology and infrastructure for that kind of practice and community. ■

Notes

1. For an example of a student project, see Jordan Thomas and Kenzie Wade, “To Live in This World,” Digital Ethnography Class, June 20, 2014, YouTube.
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3. Michael Wesch, “Episode 1: Professor’s Night Out,” *Life101.audio*, August 23, 2016. See also Jordan Thomas, “Getting Real: Journeys from a College Gap Year,” TEDxMHK, April 14, 2016, YouTube.
4. Anya Kamenetz, “What If You Could Learn Everything?,” *Newsweek*, July 10, 2013.
5. Seymour Papert, *The Children’s Machine: Rethinking School in the Age of the Computer* (New York: Basic Books, 1993), 207.

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The “Long Tenure” Approach

Polley McClure

Twenty years ago I first visited the University of North Carolina at Greensboro (UNCG) as an outside consultant. Between then and now, I have visited the campus several times as part of peer consulting groups, and so I have had an opportunity to see the evolution of IT services there—almost as a time-lapse movie. If even half of the other institutions I've worked with could post the progress I've seen at this one, there would be many more happy and well-served presidents, faculty, students, and administrators.

After my most recent visit to UNCG, I reflected on this good story, thinking about how this success came about and why the situation at many other institutions didn't work out this well. I should say, up-front, that my definition of a “good story” is not about technology per se (although the technology in this case is quite progressive) but, rather, is about the fit of technology to the purposes of the institution and about a respectful and comfortable position of the IT organization within the institution. I've come to think that there are two major themes to this story. Below and in an extended article, Jim Clotfelter describes one theme: his insightful and sensitive steering of the ship. Almost all of the points he makes would be met with positive head nods from other CIOs. The remarkable thing is that he was able to accomplish all of his goals. And that brings me to the second theme: longevity.

Wayne A. Brown, founder of the Center for Higher Education Chief Information Officer Studies (CHECS), surveyed CIOs in higher education in 2016. Of the 340 respondents, the average tenure in their role at their current institution was six years and eight months. Only 6 had been in their role at their current institution for twenty-six years or longer. In contrast, 61 had been in their current role for one year or less.¹ Up until recently, I thought this turnover was a result of the rapid changes needed in our business and the fact that any given CIO will not usually have the skills necessary to lead all of the changes that must happen. I still think that good leaders often succeed by making themselves obsolete, but I also now see the institutional downside of continuous transition.

CIOs may get impatient when new technology implementations stretch out by months, but they need to appreciate that human relationships and cultures tend to change much more slowly than the technology evolves. We can all agree that we want IT staff to communicate better and to see their role as positive enablers of other people's goals rather than as experts

who know more than everyone else. But not many of us can honestly claim to have seen that transformation happen. I think part of the reason is that with a relatively short tenure at any given institution, CIOs don't have enough time to build up the trust of their staff and others in the institution—a trust that is essential to sustaining deep cultural change.

I am not advocating the “long tenure” approach for every institution or every CIO. Many CIOs do not have the right balance of skills or the patience required to make that work. But when they do, they can produce deep and satisfying progress.

Jim Clotfelter

For more than twenty-five years, before my retirement at the end of July 2016, I was vice chancellor for an IT department at a mid-sized university in the University of North Carolina system. I've seen the tumultuous IT changes everyone else has seen over the past quarter-century, but I've seen them from the vantage point of the person who is responsible for navigating those changes at a single institution.

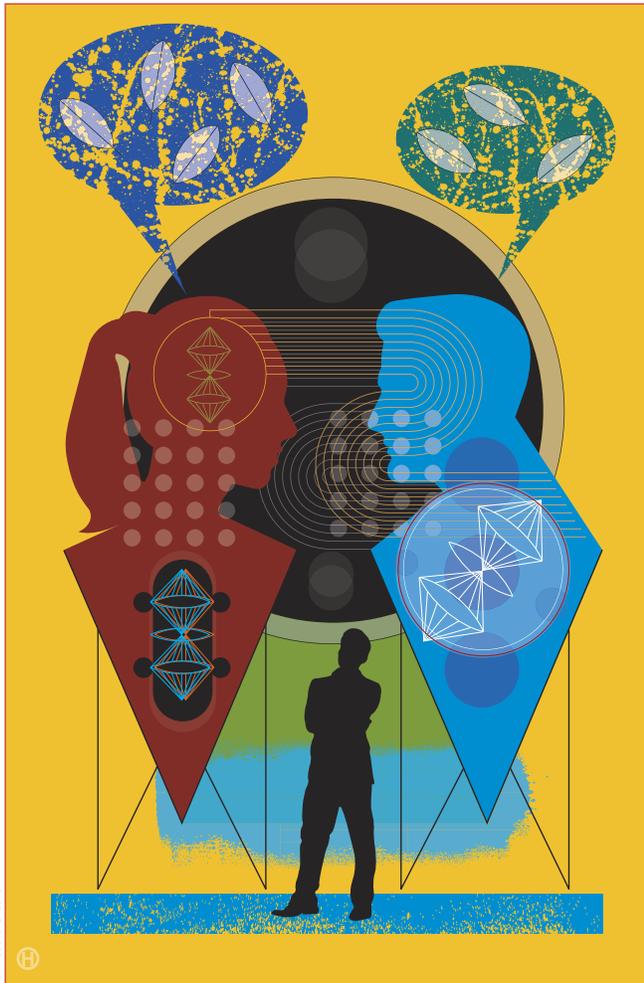
When I first became vice chancellor in January 1991, information technology was not large enough to justify its own division. My department included what I used to say was “everything that doesn't fit somewhere else.” This included the central IT organization (academic and administrative computing had already been combined), but there were only thirty staff, the largest number being programmers in support of administrative systems. The department also included university planning, institutional research, space management, legislative relations, and community partnerships. As IT needs grew, these other responsibilities dropped away, until we became purely Information Technology Services.

When I started, many people on campus didn't know what an email address was. Our clients were the fifty or so faculty who regularly reserved the computing labs or who used computing in their research, along with the administrators who handled the separate student, finance, and HR systems. Our IT resources were modest, but so were the expectations for what information technology could do for the campus. All of that changed—seemingly over one weekend in the mid-1990s when all of our 850 or so faculty and most of our students discovered the Internet.

Suddenly, everyone wanted more, and none of our new clients wanted to read manuals or look up instructions. As



By JIM CLOTFELTER and POLLEY McCLURE



Hank Osuna © 2016

at many other colleges and universities, our budget and staff grew much more slowly than did campus expectations. The university had to find ways to support a department that—unlike its siblings (academic, business, student)—was relatively new, with new kinds of financial obligations requiring new financial models. Campus leaders with experience in the traditional areas of the university had to cope with new language, new opportunities, and new risks. In no area other than finance, perhaps, are campus leaders required to trust more, and this trust had to be re-earned with each change of senior university officials.

To repeatedly re-earn this trust, leaders of the central IT organization must address numerous elements in numerous areas, including people, time horizons, vision, political realities, governance, money, critical issues, partnerships, and benchmarking (all discussed in “Culture Change and IT Leadership”). But first, if you are the central IT leader, you must start with yourself. Any leader, I believe, must meet three “P” standards: for people, problems, and perspective. You don’t need to be an extrovert, but you need to find *people* interesting. You must treat everyone with respect, including the people

with whom you disagree and the staff you’re firing. You also have to enjoy solving *problems*—there will be more of them than you can imagine. Few things are as professionally satisfying as solving apparently intractable problems. Finally, you have to have *perspective*. That means not getting overwhelmed about problems or risks. It means being confident you can get through anything and conveying that confidence to others.

In addition, the central IT leader must learn how to explain technology to non-IT people. Many non-IT people feel awkward dealing with IT issues. If these conversations aren’t handled properly, other senior officers can feel they have been talked down to, have been bulldozed into approving something, or have been simply confused further. For twenty-five years, I’ve tried to use English instead of tech-talk, but I’ve never succeeded in making my explanations short enough. I’ve always tried to give a chancellor or a provost choices, even if some of the choices are not the ones that I think are most wise. But I always gave them choices and identified the costs and risks of each option. I’ve tried never to tell a chancellor or a provost “you must do X.” Even when we entered new areas, with new technologies, I tried to play down the newness and the change. I conveyed the message that we were trying to do what we had tried to do before, but this time in a different way and with these outcomes. As quickly as possible, I turned initiatives into routines. Routines can produce calm. Whatever today’s problems are, we can solve them; whatever tomorrow’s opportunities are, we can help the institution get there.

Not many CIOs will be at the same university for twenty-five years. But if you are a CIO for longer than five to six years, and if you possess the three “P” standards, you will have the opportunity to reshape the campus culture that grows up around information technology. Some goals will take longer to accomplish than you expected, but you’ll be able to keep pushing until you reach them. ■

Note

- 1. Wayne Brown, 2016 *Higher Education Chief Information Officer Roles and Effectiveness* (Albany, NY: Center for Higher Education CIO Studies, 2016).

For an extended version of this Viewpoints column, see “Culture Change and IT Leadership” (online at <http://er.educause.edu/articles/2016/10/culture-change-and-it-leadership>), which delves more deeply into the IT leader’s work with people, planning, governance, and funding.

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1) Publication Title: EDUCAUSE Review. 2) Publication Number: 1527-6619. 3) Filing Date: 9/23/16. 4) Issue Frequency: bimonthly. 5) Number of Issues Published Annually: 6. 6) Annual Subscription Price: \$48, U.S.; \$78, foreign. 7) Complete Mailing Address of Known Office of Publication, Contact Person, Telephone: EDUCAUSE, 282 Century Place, Suite 5000, Louisville, CO 80027; Catherine Yang: 303-544-5671. 8) Complete Mailing Address of Headquarters or General Business Office of Publisher: same as previous. 9) Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor: Publisher/Editor: D. Teddy Diggs, EDUCAUSE, 282 Century Place, Suite 5000, Louisville, CO 80027; Managing Editor: N/A. 10) Owner: EDUCAUSE, 282 Century Place, Suite 5000, Louisville, CO 80027. 11) Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities: None. 12) Tax Status: The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: Has Not Changed During Preceding 12 Months. 13) Publication Title: *EDUCAUSE Review*. 14) Issue Date for Circulation Data Below: September/October 2016. 15) Extent and Nature of Circulation

	Average No. Copies Each Issue During Preceding 12 Months	No. Copies Single Issue Published Nearest to Filing Date
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16) Publication of Statement of Ownership: Publication required. Will be printed in the November/December 2016 issue of this publication.

17) Signature and Title of Editor, Publisher, Business Manager, or Owner: D. Teddy Diggs, Publisher/Editor, 9/23/16.

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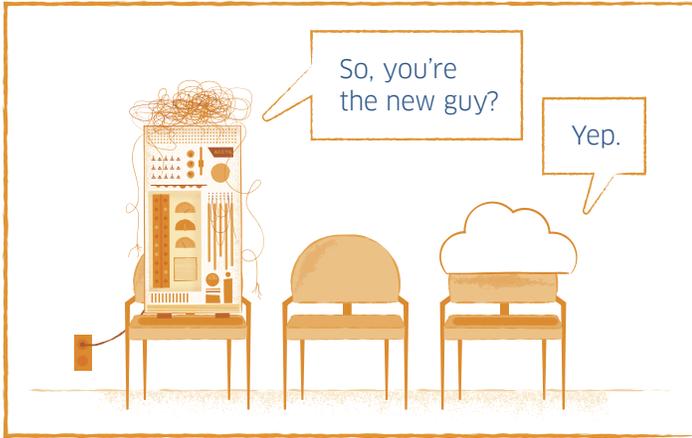
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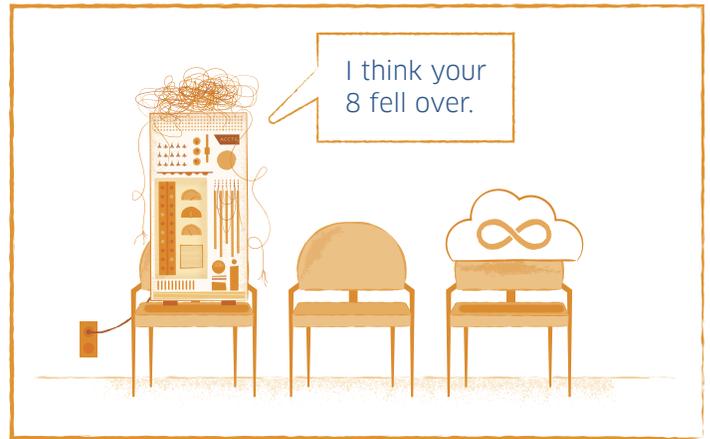
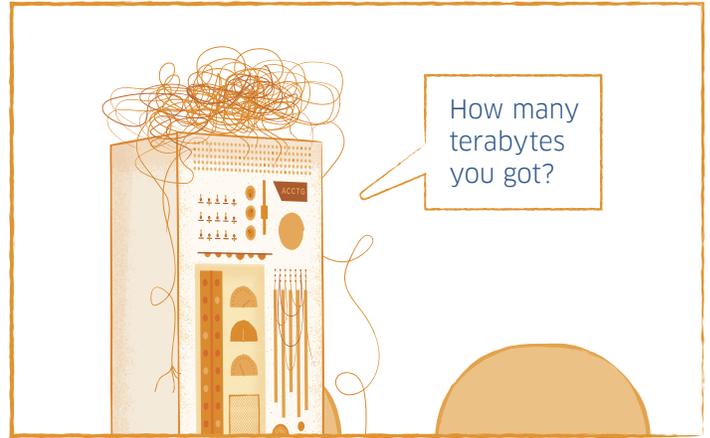


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